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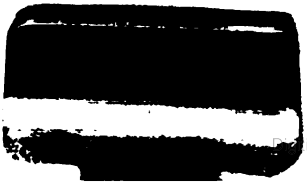

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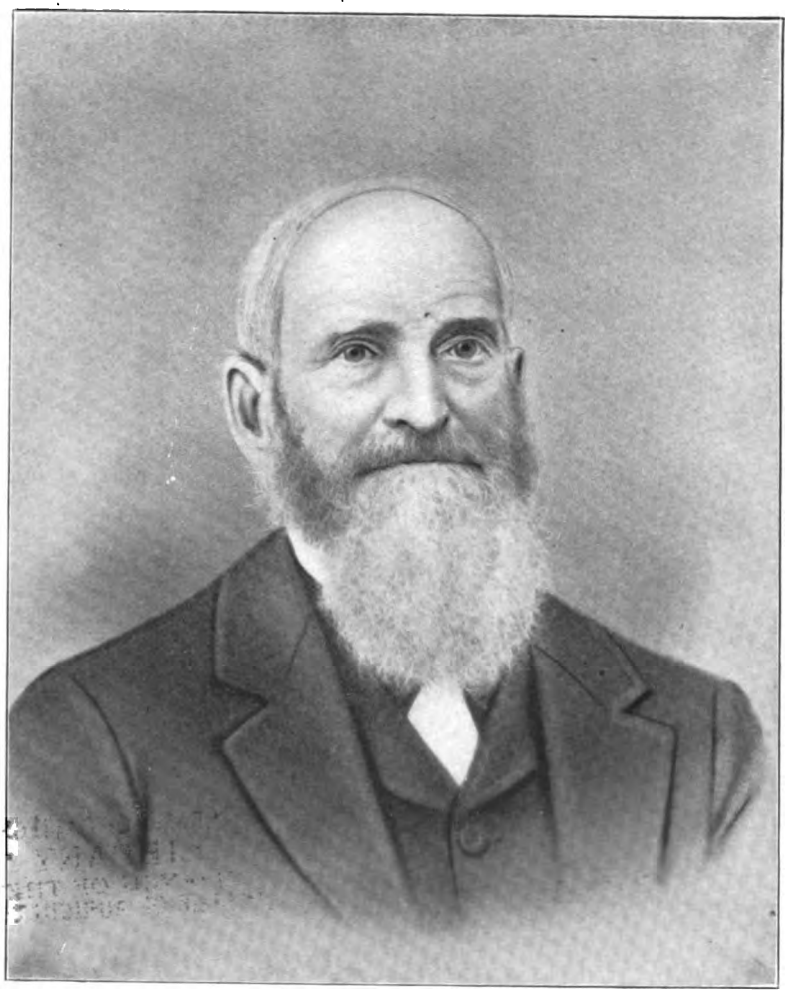

HON. H. W. LATHROP,
A pioneer in Iowa horticulture. (See page 22)

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REPORT

OF THE

IOWA STATE HORTICULTURAL SOCIETY

AGRICULTURAL LIBRARY, UNIVERSITY OF CALIFORNIA

FOR THE YEAR 1903

CONTAINING THE PROCEEDINGS OF THE

Thirty-eighth Annual Session

HELD AT

Des Moines, December 8, 9, 10, 11, 1903

ALSO TRANSACTIONS OF THE

Southeastern, Northwestern, Northeastern, and Southwestern Horticultural Societies

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EDITED BY THE SECRETARY

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VOLUME XXXVIII

PUBLISHED BY ORDER OF THE GENERAL ASSEMBLY

DES MOINES
BERNARD MURPHY, STATE PRINTER
1904

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LETTER OF TRANSMITTAL.

To His Excellency, ALBERT B. CUMMINS, *Governor of Iowa:*

SIR,—In compliance with section 1671 of the Code, I have the honor to submit to you the thirty-eighth annual report of the Iowa State Horticultural Society, showing the receipts and disbursements, with supplementary papers and discussions, including the proceedings of the four district societies, the whole showing the condition of horticulture in the state for the past year.

Respectfully submitted,

WESLEY GREENE,
Secretary,

17000

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OFFICERS

OF THE

Iowa State Horticultural Society

FOR THE YEAR 1904.

P. F. KINNE, President ..... Storm Lake
W. A. BURNAP, Vice-President ..... Clear Lake
WESLEY GREENE, Secretary and Librarian ..... Davenport
ELMER M. REEVES, Treasurer ..... Waverly

DIRECTORS.

First District—C. G. Blodgett ..... Mt. Pleasant
Second District—John Forster ..... Albia
Third District—Silas Wilson ..... Atlantic
Fourth District—William Langham— ..... Cedar Rapids
Fifth District—W. O. Willard ..... Grinnell
Sixth District—M. J. Graham ..... Adel
Seventh District—B. Shontz ..... Correctionville
Eighth District—C. H. True ..... Edgewood
Ninth District—G. A. Ivins ..... Iowa Falls
Tenth District—L. A. Clemons ..... Storm Lake
Eleventh District—J. S. Trigg ..... Rockford
Twelfth District—Eugene Secor ..... Forest City

The society keeps its rooms open at the capitol, during the usual office hours and visitors are always welcome.

The society was organized for the purpose of disseminating correct information concerning the cultivation of such fruits, flowers and trees as are adapted to the soil and climate of the state. To more fully carry on this line of work, the secretary desires to keep in touch with the horticulturists of the state by correspondence or otherwise, and asks for reports on the nature and extent of fungous diseases or insect pests which have proven distructive in the past or are noticed for the first time in any locality, and that specimens be sent to him for identification and study and as material for the museum the society is now collecting. Reports on the conditlon of the fruit industry solicited from fruit growers in every township in the state.

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FRUIT DISTRICTS.

REPRESENTED BY THE DIRECTORS NAMED ON PRECEDING PAGE.

First District—Lee, Des Moines, Louisa, Henry, Washington, Jefferson, Van Buren, Keokuk, Wapello, and Davis.

Second District—Mahaska, Monroe, Appanoose, Marion, Lucas, Wayne, Clarke, Decatur, Ringgold, and Union.

Third District—Adams, Taylor, Montgomery, Page, Mills, Fremont, Pottawattamie, Cass, Audubon, Shelby, and Harrison.

Fourth District—Muscatine, Scott, Clinton, Jackson, Jones, Cedar, and Linn.

Fifth District—Benton, Johnson, Iowa, Tama, Poweshiek, Marshall, and Jasper.

Sixth District—Story, Polk, Warren, Boone, Dallas, Madison, Adair, Greene, and Guthrie.

Seventh District—Carroll, Crawford, Monona, Woodbury, Ida, and Sac.

Eighth District—Dubuque, Clayton, Delaware, Fayette, Buchanan, Black Hawk, Grundy, and Bremer.

Ninth District—Butler, Franklin, Hardin, Wright, Hamilton, Humboldt, Webster, Calhoun, and Pocahontas.

Tenth District—Buena Vista, Cherokee, Plymouth, Sioux, and O'Brien.

Eleventh District—Allamakee, Winneshiek, Howard, Chickasaw, Mitchell, Floyd, Worth, and Cerro Gordo.

Twelfth District—Winnebago, Hancock, Kossuth, Emmet, Palo Alto, Dickinson, Clay, Osceola, and Lyon.

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EXPERIMENT STATIONS.

COMMITTEES IN CHARGE OF STATIONS.

MEMBERS ELECTED IN 1898.

All except central station to do special work as indicated below:

E. E. Little, Central station.....Ames
C. G. Patten, crossing apples.....Charles City
P. F. Kinne, top-working apples.....Storm Lake
A. Branson, plum, cherry, and stone fruit.....New Sharon
J. P. Jackson, small fruits, and peaches.....Glenwood
C. L. Watrous, pears, and apples.....Des Moines
R. P. Speer, crossing and top-grafting apples.....Cedar Falls
M. J. Wragg, plums, cherries, and ornamentals.....Waukee

SUPERVISING COMMITTEE FOR 1904.

C. L. Watrous, one year.....Des Moines
A. T. Erwin, two years,.....Ames
C. G. Patten, three years.....Charles City

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LIST OF MEMBERS.

HONORARY LIFE MEMBERS.

*Ashton, Charles.....Guthrie Center
Bessey, Prof. C. E.....Lincoln, Neb.
Brackett, G. B., U. S. Pomologist.....Washington, D. C.
Cheney-Hand, Mrs. Mary..... Charles City
Crosby, J. O.....Garnavillo
Gaylord, Edson..... Nora Springs
Hinrichs, G.....St. Louis, Mo.
*Lathrop, H. W.....Sioux Falls, S. D.
McGeehon, R. D.....Atlantic
Sage, J. R .....Des Moines
*Scott, John .....Kingman Place, Des Moines
Shankland, E. B.....Jennings, La.
Swalm, Albert W., U. S. Consul.....Southampton, England
Terry, H. A .....Crescent
Thompson, Mrs. P.....Grundy Center
Wilson, James, Secretary of Agriculture.....Washington, D. C.
Wragg, Mrs. Hannah.....Waukee

HONORARY MEMBERS.

Brown, Homer D.....Hamilton, Ill.
Guild, Dr. L. T.....Des Moines
Kellogg, Miss Harriette S.....Ames
King, Miss Charlotte M.....Ames
Merritt, Miss Alice.....Ames
Mosier, Miss Rachel L.....Ames
Nutter, Frank H.....Minneapolis, Minn.
Sandsten, Prof. E. P.....Madison, Wis.
Troutner, Miss Grace.....Des Moines
Van Zile, Mrs. Mary ..... Ames

LIFE MEMBERS.

Ameling, William.....Ottumwa
Anderson, J. P.....Lamoni
Arey, Prof. M. F.....Cedar Falls
Arthur, Robert C.....Des Moines

*Deceased.

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Armitage, Dr. Geo. I ..... Hopeville
Artman, Rev. Charles ..... Dolliver
Atkin, D..... (Address unknown)
Ayres, H. F..... Wilton Junction
Bailey, Dr. S..... Mt. Ayr
Ballard, W. C..... Meek Block, Des Moines
Bannister, Dr. M..... Ottumwa
Bacon, George S..... Des Moines
Bailey, M..... Winterset
Baker, Alvin F..... Britt
Barker, John..... Scribner, Neb.
Bartholomew, J. L..... Moorhead
Bartholomew, N..... Des Moines
Bechtle, C. R..... Le Mars
Bemis, Fred P..... Davenport
Berryhill, James G..... Des Moines
Bing, J. C..... Ottosen
Bingham S. J..... Murray
Black, G. D..... Independence
Blackman, T. W..... Nevada
Blodgett, C. G..... 307 E. Exchange, Mt. Pleasant
Boutelle, T. N..... 1470 Seventh street, San Diego. Cal.
Branson, A..... New Sharon
Bomberger, W. M..... Harlan
Budd, Prof. J. L..... Ames
Burnap, W. A. ..... Clear Lake
Carpenter, O. W..... Coon Rapids
Clemons, L. A..... Storm Lake
Clute, L G ..... F. R. D. No. 2, Manchester
Collman, A. F..... Corning
Converse, D. C..... Fort Atkinson, Wis
Corlett, John E..... Elkader
Councilman, S. J..... Boone
Curtis, B. O..... Paris, Ill.
Chaffee, John M..... Whittier, Cal.
Craig, Prof. John ..... Ithaca, N. Y.
Dean, James H ..... Fair Ground Station, Des Moines
Dayton, John F..... Waukon
Deur, C. H..... Missouri Valley
Dewey, F. G..... Thompson, Ohio
Dickerson, D. M..... Richland, S. D.
Dillon, W. H..... De Soto
Double, Z..... Seymour
Edwards, M. G..... Glenwood
Eggert, Ernest..... Pendleton, Oregon
Erwin, Prof. A. T..... Ames
Evans, D..... 405 Walnut street, Des Moines
Ferris, B. F..... Hampton
Fink, Prof. Bruce..... Grinnell
Forster, John..... Albia

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Fourt, Dr. Frank..... Fairfield
Frisbee, Jerome B.....Sheldon
Fowler, P. L.....Des Moines
Fultz, W. S.....Muscatine
Gardner, C. F.....Osage
Garrett, C. O.....Hastie
Goodwin, E. A.....Baxter
Goss, A. B.....Rural Route No. 4, Grinnell
Goss, S. G.....Lehigh
Greene, Wesley.....Davenport
Gue, B. F.....Des Moines
Gustafson, Herman.....Mediapolis
Haag, J. S.....Hosper
Hanssen, Henry H.....Long Grove
Harrington, F. O.....R. F. D. No. 1, Williamsburg
Harris, A. W.....Sibley
Haviland, W. C.....Ft. Dodge
Havenhill, Mark.....Fox, Ill.
Healy, G. B.....Sioux City
Heisz, E. R.....Nora Springs
Hicks, W. M.....Des Moines
Hicks, John S.....Roslyn, L. I.
Hill, J. W.....Des Moines
Hinkley, M. E.....Mt. Vernon
Hoffman, I. W.....Rural Route No. 4, Carroll
Hoffman, John A.....Roselle
Hoyt, Ed.....Scotch Grove
Hoyt, B. L.....Scotch Grove
Irish, Prof. H. C.....Missouri Botanical Garden, St. Louis, Mo.
Ivins, G. A.....Iowa Falls
Jackson, J. P.....Glenwood
Jensen, J. W.....P. O. Box 303, Exira
Jones, R. E.....Webster City
Kalb, Peter.....Scott
Kinne, P. F.....Storm Lake
Kirk, I. R.....Mason City
Langham, William.....Cedar Rapids
Lawrence, A. H.....(Address unknown)
Larrabee, Hon. William.....Clermont
Lau, Henry.....Rural Route No. 4, Davenport
Lewis, W. H.....Winterset
Lister, John.....Conrad Grove
Little, Prof. E. E.....Ames
Livingston, G. W.....Monroe
Lonsdale, James.....Dale City
Mathews, B. A.....Knoxville
Macaulay, T. B.....4007 Dorchester Street, Montreal, Canada
Marshall, A. H.....Des Moines
McClelland, Albert.....Rural Route No. 1, Runnells
McClelland, Gideon.....Polk

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McCoy, H. D. ..... Knoxville
McCune, J. T. ..... Ottumwa
McElroy, W. O. ..... Newton
Meek, Dale ..... Granger
Meneray, F. W. ..... Crescent
Monroe, W. C. ..... Anomosa
Moon, R. G. ..... Bedford
Murphy, J. W. ..... Glenwood
Osborn, S. C. ..... Glenwood
Pammel, Prof. L. H. ..... Ames
Parsons, M. De L. ..... Irvington
Patten, C. G. ..... Charles City
Peddie, Alex ..... Emmetsburg
Phillips, Nelson G, ... Cambridge, Idaho
Plummer, A. L ..... Rural Route No. 1, Altoona
Porterfield, D. A. ..... Traer
*Powell, Dr. F. M ..... Glenwood
Price, Prof. H. C ..... Columbus, Ohio
Prouty, J. N. ..... Humboldt
Putz, John ..... Elkport
Pugsley, M. ..... Woodbine
Rich, O. W. ..... Atlantic
Rarey, Henry W. ..... Griswold
Raymond, H C ..... Council Bluffs
Reeves, Elmer M. ..... Waverly
Rohlfs, R. M. C ..... Rural Route No. I, Eldridge
Rowen, James D. ..... Des Moines
Royer, C. B. ..... Dallas Center
Secor, Eugene ..... Forest City
Sellers, T. S. ..... Des Moines
Shaul, W. H. ..... Des Moines
Shivvers, H. ..... Knoxville
Sherman, E. M. ..... Charles City
Shontz, B. ..... Correctionville
Snyder, S. W. ..... Center Point
Speer, R. P ..... Cedar Falls
Steigerwalt, W. F. ..... Carroll
Stone, John Y. ..... Glenwood
Stutz G. W. ..... (Address unknown)
Summers, Prof. H. E. ..... Ames
Talley, S. H. ..... Hills City, Kas.
Tallman, R. S. ..... Paton
Tatum, E. ..... West Branch
Thatcher, Jonathan. ..... (Address unknown)
*Thompson, J. S. B. ..... Grundy Center
Town, Silas ..... Canby
Trigg, J. S. ..... Rockford
Trowbride, S. A. ..... Des Moines
True, C. H. ..... Edgewood

*Deceased.

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Trueblood, Stanford.....Denova
Van Houten, George H .....Lenox
Van Houten, Arthur W..... Ames
Verploegh, Abraham.... .....Pella
Wagner, J. F..... Sunbury
Warbuton, Clyde W..... ..... Washington, D. C.
Warren, C. D..... . .....Moberly, Mo.
Watrous, C. L..... ....Des Moines
Watrous, E. L..... ....Des Moines
Welch, E. S.....Shenandoah
Westcott, E. B .....Clarinda
Whitten, Dr. J. C., University of Missouri.....Columbia, Mo.
Whittington, M. G.....Rural Route No. 1, Hedrick
Wiese, Henry .....Marengo
Wilber, D..... .....Floyd
Willard, W. O.....Grinnell
Williams, H. P..... ..... (Address unknown)
Williams, A. G.....Campbell, Cal.
Williams, Theo..... ..... Benson, Neb.
Wilson, Silas..... Atlantic
Worth, W. T..... ....Mondamin
Wragg, M. J..... .....Waukee
Wragg, W. E..... Waukee
Zsherney, Jr., F. E..... ..... Amana

ANNUAL MEMBERS.

Andersen, Hans. S..... .....Kimballton
Blaise, J. P.....Des Moines
Brown, E. E.....Onslow
Brown, W. F..... ....Boone
Chalmers, A. J..... ....Des Moines
Cooper, George.....Clive
Culver, O. M.....Greenfield
Deuel, C. E.....Washington
Dailey, P. F..... .....Waterloo
Dailey, C. E..... .....309 E Park Ave., Waterloo
Dewey, B. E.....R. F. D. No. 2, Wellston Station, St. Louis, Mo.
Edmondson, E. F..... .....Perry
Ferris, S. W.....Hampton
Ferris, John C..... .....Hampton
Fleming, Peter.....Lyons
Garrett, Charles..... .....Mitchellville
Graham, M. J..... ....Adel
Gray, A. W..... ....Eldora
Hanchette, Dr. J. L. .. ..Sioux City
Hatch, A. D..... .....Hobart
Hatfield, A. W.....Correctionville
Lemon, R. K.....Mitchellville
Monger, W. S.....Mt. Pleasant
Payne, W. W.....Kingsley

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Pidgeon, David A.....New Providence
Pierce, R. S.....North East, Pa.
Read, P.....1218 Walker St., Des Moines
Richey, W. T.....Albia
Sanford, Delano.....Scotch Grove
Shipley, Albert.....R. F. D., No. 2, Beacon
Steinman, Christian.....Mapelton
Stone, I. N.....Sioux City
Tanner, F. C.....Covington
Witham, J. W.....Clive
Woodward, W. H. C.....R. F. D., No. 3, Marshalltown

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CONSTITUTION.

ARTICLE 1. This society shall be called the Iowa State Horticultural Society, and shall have perpetual succession.

ART. 2. The object of this society shall be the promotion and encouragement of horticulture and arboriculture, by the collection and dissemination of correct information cencerning the cultivation of such fruits, flowers, and trees, both deciduous and evergreen, as are adapted to the soil and climate of Iowa.

ART. 3. Said society shall hold its annual meeting each year for the transaction of its business at such time as may be fixed by said society, at which meeting officers shall be elected as follows: A president, vice-president, secretary, treasurer, and librarian, who shall serve one year. The society shall also elect one-half of a board of directors, the full board not to exceed twelve in number, who shall serve two years, except vacancies on the board may be filled for the unexpired term.

ART. 4. The secretary shall keep a full and accurate account of the proceedings of the society. He shall open and carry on a correspondence with such fruit growers, florists, and horticulturists in general throughout the state as manifest an interest in the purposes of the society. He shall annually make up a report for publication, embracing such information upon fruit growing as may come within his reach, with a full report of the business affairs of the society, and shall be allowed a reasonable compensation for his services.

ART. 5. The treasurer shall have charge of the funds and other property of the society, and dispose of them as decided by the board of officers. He shall pay out no money, except upon the warrant of the secretary and countersigned by the president. He shall make up a true and full report of all money and other property put into his hand, for the benefit of the society, with disbursement and vouchers, annually, and present the same to the secretary on or before the first day of the meeting in December, and shall be required to give bond in such sum and with such securities as the board shall direct, which bond shall be approved by the president and filed with the secretary. The depositary of the funds of the society shall be selected by the executive committee, and the treasurer shall exact a personal bond, or a bond of a responsible indemnity company from such depositary, to indemnify him from all loss occasioned by his deposits. Under no circumstances shall the treasurer or his bondsmen be released from liability to the society until full and complete settlement with, and payment to, the society has been made by him.

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ART. 6. All accounts brought against the society shall be audited by the board.

ART. 7. The members present of the board shall constitute a quorum for the transaction of business at any regularly called or adjourned meeting.

ART. 8. Any person may become a member of this society by the annual payment of $1, or a life member by the payment of $5. The annual members shall have the right to participate in all discussions and vote upon all questions except the election of officers. Honorary life membership shall be conferred only on those who have rendered valuable service to the society, and the manner of admission to life membership shall be as follows: A motion to confer life membership shall lie over until the following session and must receive the unanimous vote of those voting on the question. Should any objection be filed with the president prior to the time of taking the final vote, or if a negative vote, or votes, shall appear, the application shall be declared rejected.

ART 9. Officers of this society shall be elected by the vote of life members and of those who have become members for two consecutive years last preceding such election.

ART. 10. The fiscal year shall commence and end at the December meeting of each year, and the retiring board shall settle the business of the previous year.

ART. 11. All amendments to the constitution shall be offered in writing and receive the indorsement of the society by a two-thirds vote of the members present. The amendment shall then lie over until a succeeding session of the same annual meeting, and must again receive the approval of two-thirds of the members present.

BY-LAWS.

First—The officers of this society shall be elected on the evening of the second day of the December meeting, annually.

Second—The officers of this society shall hold their respective offices until their successors are elected and qualified, except the term of the office of secretary, which shall terminate on the first Monday of April following, at which time he shall forward his books and papers to his successor.

Third—The president, and in case of his absence, the vice-president, secretary, and treasures shall constitute an executive committee, who shall perform any business deemed necessary for the society in the absence of the board. That the executive committee be invited to sit as consultative members of the board of directors.

Fourth—The annual membership shall cease on the day preceding the first day of the annual meeting of the society in December.

Fifth—No person shall be eligible to the office of president, vice-president, secretary, or treasurer, who has not been a member of the society three consecutive years previous to election.

Sixth—No person holding the position of station keeper shall be eligible to the office of director of this society.

Seventh—These by-laws may be amended at any general meeting of the society, by a vote of two-thirds majority of members present.

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RULES.

1. Any plant that has been or may hereafter be produced by state funds shall not be eligible for premiums offered by the society on new fruits, etc.

2. Each station keeper shall follow the special line of work designated and required of him by the board of directors but he shall not be prohibited from carrying on other experimental work if he so desires.

3. He shall properly care for all stock sent him for experimental purposes, and carefully guard all experimental work intrusted to him, and report upon the condition or value whenever requested so to do by the board of directors, or by the supervising committee.

4. Each station keeper shall be furnished with a record book in which he shall note the condition and behavior of everything received and keep a complete record of all work pertaining to the experiments he is conducting.

5. Superintendents of stations shall acquire no ownership in the stock received by them for experiment, or in any new fruit originated by them in station work. Control and ownership is reserved by the society.

6. If any superintendent of an experiment station neglects to preform the duties required of him, except for reasonable cause, his station may be discontinued by the board.

7. Superintendents of stations shall meet with the supervising committee, at Des Moines, on the evening of the first day of the annual meeting of the state society.

8. The compensation of superintendents of stations shall be $25 per annum and actual expenses while attending the annual meeting, provided all reports required shall have been furnished.

9. The experiment work of this society shall be in charge of a supervising committee of three to be elected by the board of directors, each member of this committee shall serve three years. One shall be elected at each annual meeting, at which time vacancies in the committee shall be filled if any exist. The committee may annualy elect its own chairman who shall keep a full record of the work and the expenditures of the committee, and shall report the same in writing to the board of directors at their annual winter meeting.

10 The supervising committee shall have authority to procure and distribute experimental stock to the several stations, to direct all experiment work, to employ experts, if necessary, and to require such reports from each station keeper as they may think best.

11. It shall be the duty of the supervising committee to make personal examination of the condition of the work at each station once in each year. They shall report their observatians in their annual report.

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12. The supervising committee shall receive $1.50 per day while absent from home, visiting stations, and actual necessary traveling expenses and postage while performing the duties required of them.

13. When experiment stock is sent to any superintendent of station, an itimized invoice of the same shall be sent him by mail, in order that the superintendent may make as few mistakes as possible in identifying the varieties received.

14. That hereafter the reports of the directors and other transactions of the district socities shall be condensed and prepared for publication by the secretaries of the respective societies.

15. That hereafter no paper or report shall occupy more than five pages of our annual volume and the secretary is authorized to edit all reports and papers.

16. That the four district societies shall be allowed an equal sum for their support, and for the present the appropriation of each society it fixed at two hundred dollars ($200) annually

17. That the sum of four hundred dollars ($400), or as much thereof as shall be needed, be appropriated for carrying on the work at the experiment station in 1904. This sum to include expenses of experiment station keepers.

18. That the president be empowered to appoint delegates to meetings of the state horticultural societies of the states adjoining Iowa.

19. That the reports of the society shall not be sent to county or district societies with an annual membership fee of less than $1.

20. That the time of the annual meeting of the society be fixed for the second Tuesday in December.

21. That C. L. Watrous, Eugene Secor, Silas Wilson, Wesley Greene and M. J. Wragg be appointed a committee on legislation.

22. That the executive committee shall be a committee on program for the ensuing year.

23. That the reports of the twelve directors of the state society be submitted to the secretary of the society on or before the first day of the annual meeting.

24. Except by unanimous consent no paper or address shall occupy more than twenty minutes in its delivery, and in discussing questions, no members shall speak more than five minutes, nor more than once until all who desire to speak have spoken, unless by permission of the society. It is the duty of the president to enforce this rule, and it is the privilege of any member to demand its enforcement.

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PREMIUMS ON FRUIT.

The society offers $195 in premiums for fruit, viz., sixty-five dollars ($65.00) in premiums for exhibits of apples, or pears, grown in each of the three fruit districts. The northern district shall include the four northern tiers of counties; the central, the next three tiers, and the southern district the two southern tiers of counties in the state.

The judges shall award premiums according to the merits of each exhibit; but no exhibitor shall be awarded a premium to exceed one dollar for each plate of any standard variety of apple or pear shown, nor more than two dollars for any plate of seedling apple or pear.

The entries to be made with the secretary in the name of the grower and the fruit to be placed on exhibition the first day of the meeting.

All plates of fruit in competition for premiums must bear an entry card with the correct name of the variety.

A plate of fruit shall consist of four specimens; each specimen shall be in good condition, with the stem and calyx well preserved; of averege size, color and form; not marred by insects or fungus.

A SPECIAL PREMIUM FOR SEEDLING APPLE.

For best seedling apple grown in either district, whether by exhibitor or not, and accompanied by written statement as hereinafter provided, there may be awarded a special premium of $15, for not less than twenty scions of it, for use of the experiment station of the society. This premium shall not be awarded unless the fruit and statements convince the committee that the variety has such promise of permanent value as to warrant its propagation for trial. The statement must show age of tree, its comparative hardiness and productiveness, its origin as far as known; the character of soil and subsoil, whether timbered or prairie land, situation as to shelter and slope, nearness to water, and its comparative elevation. The premium shall not be paid till scions are delivered in good order to superintendent of the experiment stations. No premium shall be paid on any seedling unless scions of it are furnished, if desired.

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PROCEEDINGS OF THE

Thirty-eighth Annual Meeting

OF THE

Iowa State Horticultural Society,

Held at Des Moines, Iowa,

December 8, 9, 10 and 11, 1903.

TUESDAY MORNING SESSION.

The society was called to order by the President, M. J. Wragg, after which the divine invocation was pronounced by Dr. L. T. Guild, of Des Moines.

W. A. Burnap, vice-president, assumed the chair.

VICE-PRESIDENT: The next thing in order on our program is the president's address.

PRESIDENT'S ANNUAL ADDRESS.

Members of the Iowa State Horticultural Society, Ladies and Gentlemen:

We meet again to commemorate our thirty-eighth annual meeting of the Iowa State Horticultural Society. As we look about us there are but few, if any, whose labors date back to the inception of this society. We had hoped to meet in our old rooms, which had been set apart and dedicated for the use of this society in its horticultural work in the State. But we have the assurance that it will be but a short time until we shall be reinated in our old quarters; and it is hoped amid its hallowed surroundings and pleasant memories, we may enjoy ourselves.

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IN MEMORIAM.

We are again called upon to announce the decease of the following of our members since we last met:

Honorary Life Members.—Hon. Charles Ashton, of Guthrie Center; H. W. Lathrop, of Iowa City; John Scott, of Nevada.

Life Members.—Dr. F. M. Powell, of Glenwood and J. S. B. Thompson, Grundy Center.

Hon. Charles Ashton lived to a ripe old age. He was one of this society's most devoted and ardent friends. He was for many years editor of the *Gutherian*. During the World's Fair at Chicago, Mr. Ashton served with honor and distinction as one of Iowa's Commissioners. He was one of those honest and fearless men whose life work was a potent factor in the making of Iowa history.

In the death of Hon. John Scott, this society loses a good friend. He was a man interested in the horticultural and agricultural development of our State, and never lost an opportunity to say a good word or do anything in his power to promote the Horticultural interests of this society. He was one of those big hearted men, whose life was an inspiration; and his life work, both with the Horticultural and Agricultural societies will be felt for years to come.

Dr. F. M. Powell served in the capacity of president of this association during the years of 1895 and 1896, and departed this life on August 19, 1903. The Creator saw fit to take him away, as it were, in the zenith of his great life work, and usefulness to our great State. Doctror Powell was a professional man, and one well up in the medical profession; yet he took a great and lively interest in the work of this society, which he has served in the official capacity of director, vice-president and president. His great work in horticulture and floriculture was at Glenwood, while he occupied the position of superintendent of the State institution located there. A gentleman of refined and esthetic taste, he did a great work along the line of horticulture in teaching and imparting horticultural knowledge in the institution of which he was the head. He was a great advocate and believer in Nature's study; and many of the theories which he advanced before this society he put into thorough and active practice in his school work of the institution. His many articles and addresses before t is and other societies, serve as an index to the great love and interest which he took in the beauties of Nature. Few men have had such a just appreciation of the ethical relations of his duty to his fellow man, and his value in the world is not reckoned by what he has accomplished for himself, but by what he has done for others. Hundreds of homes hold him in greatful remembrance for what he had done for their unfortunates. He was a man of broad humanitarian spirit and wide sympathy, and devoted his life to the benefit and assistance of some of his unfortunate fellow creatures. For twenty-one years he presided over the affairs of the State institution at Glenwood, devoting his energy and talents to the upbuilding of this great state charity.

Henry W. Lathrop was born in Massachusetts, October 28, 1819. He died in Sioux Falls, S. D., December 27, 1902. He was a descendant of the Rev. John Lathrop, who came from England in the sixteenth century, landing at Plymouth. He spent the early years of his life in Augustus, N.

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Y. He spent a year in a classical school near Boston, after which he studied law and was admitted to the bar in Iowa City, in 1847. From that time he resided in Iowa City, or near there, until about one year ago when he removed to South Dakota, and took up his residence with his daughter, his wife having died several years previous. Mr. Lathrop spent many years on his beautiful farm on the west bank of the Iowa river, opposite Iowa City. He was one of the official reporters of the "Constitutional Convention" of 1857, and has done a great deal of reporting in the legislature and much editorial work; aside from writing correspondence for leading newspapers in Chicago and Des Moines. He was for a time editor of the *Iowa City Republican*. He also contributed many articles to the Iowa Historical Record; and the old annals of Iowa; but his greatest literary work was the life of Governor Kirkwood, which has found its way into many of the libraries of this and other states. Mr. Lathrop was deeply interested in Iowa history, to which he made many valuable contributions. He was one of the first treasurers of the State University, which office he held for seven years. He was one of the most useful and distinguished members of the Iowa Horticultural Society, and his work in this society dates from its early history. He has filled almost every office in this society, and his life work has so touched the history of Iowa during its pioneer days that it has become a part of the growth of the State. As a man, all loved him who knew him; he was of that singularly noble and upright character; tenacious in his opinions, and when he had reached a conclusion he was firm. We were all proud of his friendship; of his splendid citizenship. and he filled up to the fullest measure the ideal life. "He was the noblest Roman of them all." His life was gentle and the elements so mixed in him that nature might stand up and say to all the world: "This is a man."

ST. LOUIS EXPOSITION. We are now just on the eve of one of the greatest, if not the greatest, exposition ever held in the world. Preliminary steps were taken by the society one year ago, and the Hon. Silas Wilson was nominated as Superintendent of Horticulture, the same being confirmed by the Commission. He will have control of the horticultural exhibits from this state. In 1904 Iowa will have an opportunity to place an exhibit of her resources, both horticultural and otherwise, along with the products of her sister states. In view of this fact there is a certain state pride that appeals to every one of her citizens, and the verdict of her people is "that of all that is good, Iowa affords the best." To maintain ourselves in this position it behooves each one of us, in every department of horticulture, agriculture, and manufacturing, to do our best in seeing that the resources of Iowa are fully represented at this great exposition. To aid in this great work, our last legislature made a very liberal appropriation, which has already been found to be too meager, and we hope that the present legislature will see its way clear to make an additional appropriation so that we as a people have the assurance of the full support of our people. As to the plans of the present Commission and the amount of money that will be put into horticulture I have not so far been able to learn, but trust that we may receive our just share, and that the members of the society will all hold themselves in the proper attitude to work in harmony with the Superintindent and Commission, so as to bring out an exhibit in horticulture that will sustain our past reputation as a reliable fruit-growing State.

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LEGISLATIVE COMMITTEE. Owing to the fact that our legislature meets biennially, the legislative committee appointed by our president one year ago has had but little to do. I am pleased to report that this committee has made itself felt in the years past, and I hope that this body will see that the proper committee is appointed at this meeting to look after our interests before the coming legislature. With the advanced interests of horticulture in our State, it will be but a short time before this society will need additional aid to carry on its great work. I am confident that the general assembly will never regret the money voted for promoting the great interest of horticulture in our State.

OUR REPORTS. One of the great difficulties with which our society has had to deal in the past is the manner of printing and distributing our reports, which has caused them to be late for distribution. There seems to be a feeling among some that there should be some other means of disseminating the contents of this volume at intervals throughout the year. The same was alluded to in my report one year ago. It is believed by many that if arrangements could be made to have a monthly report published throughout the summer, which should contain practically all information, papers, discussions etc., pertaining to the work of the month, that we would get greater results from our investigations than we are getting under the present manner of printing and distributing our reports. Of course this has been discussed before by this society, and it will take an act of the legislature, possibly, to make any change. But I deem it the proper place and time to commence the agitation, for if there is any better way of disseminating horticultural knowledge among our people we should know it.

HORTICULTURE. Horticulture as an art embraces three mighty industries; the cultivation of fruits, flowers and trees, and creates a sentiment in man that appeals in his higher and nobler instinct. It is a calling which dates back into the mystical past. To those who have worked under the enchanting inspiration of the "Goddess Pomona", it has been found a science calculated to afford the intellect abundant themes, high inspirations, and the means of filling the soul with perpetual gladness and joy. There is no science or calling known to man that is more attractive and elevating in its multiplied allurements than horticulture, and the true student of Nature is ever unfolding new lines for investigation and study, which reveals new worlds of beauty in the realm of Nature.

EXPERIMENT STATIONS. At the present time I fear that the experiment stations inaugurated by this society are not doing as good work as is possible for them to do. Of course, I realize that the work of the experiment committee in the past decade has been the means of great good in bringing out many new and useful fruits and trees which have found a home of adaptation in our state. But the work of these stations should not be allowed to lag but should be pushed with energy and a little more system. The experiment committee having the experiment station in charge should have a record of all plants that are in the different stations under test. Said record to show where the plants were received from and when they were received in the station; and when reports are made by the different station keepers, it should show the different surroundings and environments of the plants, and what conditions have been afforded by the different experiment stations.

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I am confident that we can increase our work greatly and efficiently, and it should be the aim of this society to make our experiment work one of the special features. I am in perfect sympathy with the work of this committee along the line of cross fertilization and pollenization with the object of creating new varities of fruit; yet I am confident if we would pay a little more attention to gathering up stray seedlings from the different parts of our State, it would afford great opportunity for getting varieties adapted to our climatic conditions.

AUXILIARY SOCIETY. Under the present arrangements, with four auxiliary societies representing the four quarters of the State, with the State society located at the Capitol, we ought, in my opinion, be able to disseminate correct horticultual information, and popularize our work and bring the great blessings of horticulture in reach of every school district in the State. Our State society should be great and broad, and magnanimous enough to take in all branches of horticulture, and should be the fountain head and the "Alma Mater" for our four auxiliary societies, as well as for the Park, Forestry, Floral and Cemetery associations. We welcome them *all* into our midst, believing that with all this great machinery we ought as a State society be able to do a greater work for our people than we have in the past. We are glad to report that during the past season there has been a great increase in tree, park and cemetery improvements throughout the State. I have had the pleasure of visiting two of our auxiliary societies this winter, and can report that they are doing good work. We also want the members of these auxiliary societies not to lose sight of the fact that their being members of the same does not make them members of the State society. We believe to bring the work of these subordinate societies in closer touch with ours, it would be best that the Secretaries of the four societies be required to meet at our annual meeting, where in consultation with the Secretary of the State society, plans for the future could be best laid. The time of the meeting of the four auxiliary societies should be set so they will not conflict with each other, as our State secretary often wishes to visit all four auxiliary societies, for the purpose of making investigations, taking notes, etc.

SUMMARY. As we proceed to take up the work of this thirty-eighth annual session of our society, let us be mindful of the rights of others. We wish to extend to all members the courtesy of the freedom of speech on this floor, and hope to get from every member new ideas pertaining to horticulture; and what they have learned in the past through their study of the great "Mother Nature," as taught them in the song of the bird, the enchantment of the flowers, or coming in contact with the great invisible in Nature. There are those among our members who have toiled for years to present new fruits and flowers best adapted to the different climatic conditions of our own state; many of them are to old to be with us today. We had hoped to see our old friend Terry, of the Western slope, and Captain Speer, who has accepted every honored position of the society, with us at this meeting. It is to such men as these that the credit and honor should be given for the advanced position that we now occupy as a society.

I extend to our visiting delegates a cordial and hearty greeting, and we want you to feel free to take part in our deliberations. We hope that your coming among us may be beneficial not only to yourselves, but that you

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may receive some enthusiasm that may be of value to carry home to your people, But we assure you that we feel honored by your presence.

CONCLUSION. Now at the close of this meeting, I wish to thank the members of this society for the honor they have conferred upon me during the past few years, by electing me to the high and honored position of president. I have tried at all times and under all circumstances to leave my impress on this society. I have lifted up and led out on any new line of work which I thought would be of any value in promoting horticultural interest in our State. I only hope that this great work may go on, and as the work is laid down by one it may be picked up by another with courage and enthusiasm and be pushed forward, by developing the great recourses of Iowa Horticulture.

During the past year the sickle of the great destroyer, Death, has been greatly felt in our midst. I am glad that those who have gone before have left their great impress on this society. We will meet them no more in friendly greetings, nor hear their mingled voices in our councils. Their cheering words have often lifted us up and given us courage and new zeal for work and they will be remembered by us for their life work; their many kind deeds will be as a cynosure in the sky of our remembrance to them

VICE PRESIDENT: I will appoint as a committee on the president's address Capt. C. L. Watrous, Mr. J. P. Jackson and Mr. Abner Branson.

President Wragg assumes the chair.

THE PRESIDENT: The next thing on our program will be the report of our secretary, Wesley Greene.

REPORT OF SECRETARY.

Each year brings new experiences to the fruit grower, or emphasizes old facts with so much stress as to impress them more firmly upon the mind. Many of us will remember for a long time the 30th of April, 1903. On the morning of that day the thermometer registered seventeen degrees at Larchwood, in Lyon county, and thirty-three degrees at Keokuk, in Lee county. The line of full bloom at that time extended across the State near Des Moines. Even the thought of ice and snow glittering among the apple blossoms sends a chill down the spinal column of the orchardist that shakes coin out of his pockets.

With an average temperature ranging between twenty-five and twenty-eight degrees over most of the State on that morning the outlook for a crop of fruit was not very encouraging. Twenty-seven to thirty degrees is considered to be very near the danger line when fruit trees are in full bloom. Records have been kept which show that swelling fruit buds have withstood eighteen degrees without injury. But fruit buds and blossoms, like other vegetative substances, are capable of resisting different degrees of temperature when other conditions are apparently the same. Not infrequently we have noticed two plants of the same variety standing close together, the one

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frozen and the other unharmed. It seems to be a well established fact that the nearer the fruit bud has developed into a perfect flower the tenderer it is. With eleven degrees lower temperature north of Des Moines, where the fruit buds were the least developed the crop was the best, while in the southern part of the state with five degrees higher temperature the crop was not so good. In many localities where the fruit had set when the freeze came it showed the injury by its distorted form at picking time.

The trees went through the winter in good condition as shown by the percentages in March, as follows: Apples 90 per cent, pears 85 per cent, plums 96 per cent, cherries 85 per cent, and peaches 40 per cent. In August the percentage on apples had dropped to 48 per cent, pears 9 per cent, and peaches 20 per cent. Pears and plums were almost a complete failure. Peaches were but little better. Grapes were a fair crop but the quality was not high. Apples were a poor crop and the quality of the fruit, generally, was inferior, though some orchards escaped injury and produced good crops. Raspberries, blackberries, and strawberries produced good crops which sold at fair prices.

The collecting of crop statistics is receiving more attention each year. The data thus secured supplies the best information as to the probable amount and distribution of the crop. The more accurate these reports can be made the greater their value to the producer and consumer in determining the price and distribution of the crop.

We have added thirty volumes to the library durlng the year, including the last two volumes of Professor Sargent's Silva of North America. The bulletins of the experiment stations should be bound in some form so as to make their contents more easily accessible to those who wish to consult them on any matter relating to horticulture.

The herbarium has increased during the year so we now have more than 1,000 specimens of native and introduced plants that are growing in the state. We have received specimens for it during the year, from Prof. L. H. Pammel, of Ames, and J. P. Anderson, of Lamoni. We have also secured a much needed cabinet from the State in which to arrange the specimens so as to have them more easily accessable at all times for study or to compare with plants sent to the office for identification.

We hope arrangements can soon be made to secure a more complete collection of insects injurious to garden crops, and of those which are beneficial in assisting the gardner in combatting his foes.

We are pleased to announce to the members that the executive council of the State has acted favorably upon the resolution past at the last annual session, and has recently assigned for the use of the society the room formerly occupied by it when the Capitol building was built, and that we will probably soon get possession of it.

The miscellaneous expenses of the society for the biennial period ending June 30, 1903, was $6,528.54; office supplies and postage $634.02; printing by state printer $2,020.91; paper used $780.58; binding by state binder $2,702.00; for cabinet and half-tones $152.15. The total disbursements for horticulture by the State for the biennial period ending June 30, 1903, was $12,818.20.

As the legislature will be in session this winter, the society should have a strong committee to look after the interests of horticulture. There is need

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of both State and Federal legislation to regulate the sale and distribution of horticultural products. I believe a federal law regulating the grading, branding and inspection of fruit for export would be helpful to the fruit growers of this State. That the inspection and branding of products manufactured from fruit to be used for food would be for the best interest of our people; that the inspection and enforcement of quarantine regulation against diseased and insect infested plants, which are now recognized as dangerous to orchards and gardens when disseminated among them, is of special importance to fruit-growers, as well as to the general public, and should receive the careful attention of our lawmakers. While these subjects are of National importance and should receive attention from the Federal Government, yet it remains for each State to protect as far as it can the property and health of its own citizens.

I believe the society should co-operate with the Department of Agriculture in the work of the Farmers' Institute, and that the members of the society in each county should see that horticulture is well represented on the program at these meetings.

During the year we have assisted in organizing a society of Iowa Florists and hope that in time it will affiliate with the society and be represented on the program. We hope that the market gardeners can also be brought together, each of these separate organizations pursuing its own special line of work would, in the end, find it to their best interest to affiliate with the State society and have a day set apart for their special program. It is not the object of the State society to monopolize the whole field to itself, but to organize it in special lines, so as to cover the whole range of gardening. If this can be done better by specializing in certain branches, as parks, cemetries, orchards and small fruits, market gardeners and florists, etc., let it be along those lines, each and all of these efforts to improve special field of usefulness in the community should find a helping hand and a generous welcome to our home.

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FINANCIAL STATEMENT.

RECEIPTS.

14 Life member	$ 70.00	
42 Annual members	42.00	
Park and Forestry Association for use of lantern	10.00	
Contingent fund	350.00	
Total		$ 472.00

DISBURSEMENTS.

Due from last report	$ .60	
American Express Co.	6.90	
Adams Express Co.	5.35	
United States Express Co.	18.17	
Wells Fargo Express Co.	8.80	
White Line Express Co.	5.76	
Bausch & Lomb, paper, plant press, etc.	6.00	
Books	100.80	
Typewriter brush	.25	
Star Engraving Co.	29.55	
Frank Randolph, wax, resin, etc.	1.50	
H. W. Ness, mounting specimens	8.80	
M. J. Wragg, expense in getting specimens of evergreens	2.50	
Mrs. C. K. Fluke, for crayon, photograph, etc.	10.00	
Capital Lodge, use of lantern	80.00	
Miss Bertha Query, stenographer	58.00	
J. P. Blaise, stenographer	70.00	
Mrs. J. W. Watson, office work	2.00	
Bishard Bros., printing programs, etc.,	16.50	
Treasurer's voucher	112.00	
Cash to balance	.02	
Total		$ 472.00

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THE PRESIDENT: We will now have the report of the treasurer, Elmer M. Reeves.

REPORT OF TREASURER.

DISBURSEMENTS.

Number Warrant.	To Whom and for What Purpose.	Amount.
23	F. E. Pease, delegate to Minnesota meeting	$ 19.15
24	J. P. Jackson, station fee and expenses at meeting	45.00
25	M. De L. Parsons, premiums on fruit	18.00
26	C. O. Garrett, premiums on fruit	20.15
27	Wm. Langham, expenses at winter meeting	19.10
28	H. C. Price, station fee and expenses at winter meeting	32.72
29	C. H True, expenses as director	19.85
30	G. A. Ivins, expenses as director	9.30
31	C. L. Watrous, station fee and expenses	35.00
32	Silas Wilson, expenses as director	14.50
33	C. G. Blodgett, expenses as director	16.84
34	A. Branson, station fee, premiums and expenses	37.40
35	C. L. Watrous, trip to Davenport on committee work	14.40
36	Eugene Secor, expenses as director	18.00
37	W. A. Burnap, expenses as director	19.76
38	B. Shontz, expenses as director	28 90
39	P. F. Kinne, station fee, expenses as director	42.26
40	W. O. Willard, expenses as director	10.90
41	M. J. Graham, expenses as director	7.32
42	M. J. Wragg, station fee and expenses	35.80
43	C. G Patten, station fee and expenses	43.35
44	E M. Reeves, salary as treasurer and expenses	120.86
45	C. H. True, premiums	17.50
46	B. Shontz, appropriation to Northwest society	200 00
47	C. L. Watrous, expenses as delegate to Missouri	36 80
48	Wesley Greene, monthly salary	100.00
49	Wesley Greene, clerical help	48.75
50	Wesley Greene, janitor	15.00
51	Wesley Greene, contingent expenses	200.00
52	E. M. Reeves, hotel expenses of delegates	28.50
53	C. L. Watrous, one-half expenses to Plant Breeders' Congress	49.49
54	H. C. Price, one-half expenses to Plant Breeders' Congress	44.80
55	F. O. Harrington, treasurer Southeast society	200.00
56	O. A. Marshall, treasurer Northeast society	200.00
57	J. P. Jackson, treasurer Southwest society	200.00
58	B. Stuart, premiums	17.75
59	G. W. Gawens, premiums	13.20
60	J. P. Jackson, premiums.	28.70
61	E Howell, premiums.	1.25
62	B Stuart, premiums	5.95
63	H. C. Price, delegate to Illinois meeting.	33.26
64	J. P. Jackson, delegate to Nebraska.	5.48
65	Mrs. N. K. Fluke, expense at experiment station.	8.20
66	Wesley Greene, salary to February 13, 1903.	200.00
67	A. T. Erwin, expenses as delegate to Wisconsin	28.66
68	R. P. Speer, station fee.	25.00
69	Wesley Greene, two months salary	200.00
70	H. C. Price, plum trees for station.	3.60
71	M. J. Graham, stock for stations	11 63
72	H. P. Sayles, plums for stations	4.25
73	Mrs. N. K. Fluke, stock for stations	13.00
74	C. L. Watrous, stock for stations	8.64
75	R. D. McGeehon, small fruit plants	6.25
76	W. F. Allen, Salisbury, Md., stock for stations	2.02
77	H. Harrington & Co., Windsor Chief and Lowland trees	3.15
78	E Gillett, plants	1.50
79	F. L. Kenoyer, blackberry plants	2.00

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DISBURSEMENTS—CONTINUED.

Number Warrant.	To Whom and for What Purpose.	Amount.
80	John Charlton, plants	$ 7.50
81	Jackson & Perkins, Columbian Belle roses	2.50
82	T. V. Munson, grape vines	15.60
83	H. C. Price, express and expenses for stations	17.23
84	E. S. Welch, Eleagnus longipes	8.75
85	O. F. Brand, Peerless apple trees	10.50
86	M. J. Wragg, twelve plum trees	3.00
87	Mark Havenhill, expenses and work at Patten's station	7 47
88	E. B. Watson, expenses and work at Patten's station	28.83
89	W. C. Claybaugh, expenses and work at Watrous' station	10.47
90	Mark Havenhill, work at Watrous' station	6.69
91	Mrs. Mary Little, making sacks for crossed fruit	6.85
92	Franklin Brown, gathering pollen	8.30
93	Earl D. Smith, pollinating	2.55
94	C. D. Findlay, pollinating	2.55
95	A. R. McMillan, pollinating	2.25
96	H. C. Price, pollinating	2.55
97	Wesley Greene, two months salary	200.00
98	C. G. Patten & Son, Fameuse seedling trees	3.00
99	Wesley Greene, two months salary	200.00
100	Elmer Reeves, expenses attending meeting of committee	8.50
101	Wesley Greene, delegate to pomological meeting	82.40
102	Wesley Greene, two months salary	200.00
103	Wesley Greene, contingent fund	150.00
	Total	$3,548.23

TREASURER'S BALANCE SHEET.

E. M. Reeves, Treasurer Iowa State Horticultural Society.

To balance at settlement December 9, 1902	$1,321.87	
Warrants from State Auditor	4,000.00	
Memberships received during year	112.00	
Total		$5,433.87
Credits by warrants paid	$3,548.23	
Balance on hand		$1,885.64

THE PRESIDENT: I will appoint as a committee on the report of the secretary, William Langham, C. G. Blodgett and Ben Shontz.

As a committee on the treasurer's report, Eugene Secor, M. J. Graham and W. O. Willard.

I will appoint as a committee on awards of fruit, Prof. A. T. Erwin of Ames College.

The program will now be opened by a paper entitled, "Some Relations of Native Plants to Environment," by Prof. B. Fink of Iowa College, Grinnell.

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SOME RELATIONS OF NATIVE PLANTS TO ENVIRONMENT.

BY PROF. B. FINK, IOWA COLLEGE, GRINNELL.

The members of this society are wont to discuss the economic side of botanical questions, and it occurred to the writer that it might be in order to present some of the ecological aspects of the subject. One needs only to glance through the reports of this society to ascertain that there is great diversity of opinion regarding many of the practical questions considered from time to time by the horticulturists of Iowa. One would plant this tree or shrub, and another thinks it should not be cultivated at all or at least not in Iowa. One would plant in a particular way and at a particular time, and to another this particular time and manner are an abomination. Thus these practical questions are threshed over and over, and the writer intends in the near future to go through the state horticultural reports quite carefully and collate the various views on certain interesting questions so as to have the information at hand for easy reference in future studies. What one has actually done is more worthy of consideration than a large amount of theory, and though I may not be able to follow another man's method successfully, it is necessary, for best success, to have a good knowledge of various plans of work.

But leaving these questions of the methods of men for the moment, let us turn to Nature's great farm and see how the work is done there. This carries us somewhat away from horticultural considerations, but the theme is not hackneyed. Indeed, ecology or the systematic study of the adaptations of plants to certain environment, is the newest line of botanical study, and although ecological studies may have already passed dangerously near to the fad-stage, ecology has come to stay and is giving new life and interest to botanical studies. Again, I need offer no apology for turning the attention of this meeting aside from the more practical issues for a short time, for our methods are but an attempted improvement on Nature's way of doing things, and we may draw many practical lessons by thoughtful application.

Just as our cultivated plants respond to certain methods of treatment, so wild plants respond to natural conditions of light, heat and moisture. When a horticulturist wants a tree to grow tall he cuts off the lower branches, and when he wants it to be stocky, he allows the side branches to grow and trims back the top if necessary. Likewise in nature the tree growing in the open is short and spreading, while in the dense forest, the same tree grows up so as to spread its leaves out to the light, and it becomes tall, the lower branches dying. Thus what man does for the sake of appearance, the wild tree accomplishes for another purpose as illustrated so well by our pines which have a very different form in the pineries than that of the scattered wild or cultivated pines of Iowa.

Indeed, not only does the plant as a whole respond to these conditions of light, heat and moisture, but if we examine more closely we shall find that every leaf, every stem, every root, and every cell of every root, stem and

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leaf responds more or less in form, texture or make-up. Every leaf is in a sense a stomach and a lung. Carbon-dioxide is taken from the air, unites with water absorbed through the roots, and starch, certain sugars and other substances are built up into plant tissues or plant food. Added to the carbon-dioxide which constitutes about half of the food of the plant, is about an equal amount of various salts taken up by the roots. The roots also grapple the soil and hold the plant in the erect position, and the leaves also act as breathing organs. So much for the principal uses of leaves and roots, and we shall note later something of their peculiar adaptations. Meanwhile it may be remarked here that the main function of the stem is to bring the leaves and seeds up into the air, so that the latter may be dispersed and the former spread out to the light.

Passing to the adaptations of leaves, the leaf is usually spread out more or less horizontally so that the sun may shine upon it, but all young growing leaves and many mature ones are motile and change their position under different conditions of light and heat. Thus the wild partridge pea gradually changes the position of its leaflets so as to delicately adjust them to varying conditions of light, temperature, winds and moisture and will also act in response to artificial stimulus. If vigorously tapped for some time with a lead pencil, the leaflets will slowly fold together, and when growing along a railroad track, the plants between the rails will be found after the passing of a train to have their leaflets completely closed, and passing outward from the track, one finds the leaf-position affected less and less till a few feet from the track, the movement of the air caused by the passing train has not perceptibly affected leaf-position. This is but one illustration and similar adaptations in such common leaves as clover, cabbage, radish and sorrel may merely be mentioned, nor can we more than note the compass habit.

There is also an obvious adaptation in all of the common leaf forms, sizes and arrangements. The so-called rosette habit is nicely illustrated in such common plants as mullein, shepherd's-purse, Indian-tobacco, campanula, plantain, dandelion, etc. Here the larger leaves are spread out over the ground in concentric fashion, while the erect stems bear few and small leaves or none at all. Though these plants thrive well in moderately moist places, the adaptation is plainly for protection against drought. The leaves forming the rosette are on the ground where not so much dried out by winds, and they all cover the surface about the roots and help to hold in the moisture, Large leaves on the stem above would shade the rosette and defeat the object of the arrangement and position, and these higher leaves would be more exposed to drying winds and would not help to hold in the limited amount of soil moisture. Hence these plants have learned to devote their energy to the production of a rosette of leaves at the surface, and put up a stem, with few and smaller leaves or none, merely for the purpose of getting the fruit up into the air where the pollen may be scattered better, the flowers may attract insects, and finally the seeds may be scattered more effectively. How many of us have noticed how these plants, or some of them, always appear in neglected gardens or sandy places where little else is growing and then spread out over the ground as if in an attempt to cover it and hold in the moisture. There may be an abundance of moisture in the soil of the garden when the plants begin to grow in the spring, but the plants, as if having learned by long experience what will come later if

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the gardener's hoe does not disturb them, instinctively begin at once their spreading habit. Some others that appear with these are the strawberries and their allies, which cover the ground rather by the running habit and also the spreading yard-grass (*Polygonum*), pusley and some euphorbias. Here we may well learn a lesson from Nature's plan. We need not necessarily resort to plants having the rosette habit, for we have few of them in cultivation; but we may see to it that we cover the ground well if we live in a region where the rainfall is small, or if the prospects are for a dry season. This may be done by increasing the amount of seed sown or planted.

There are many other leaf adaptations such as the relation between size and form of leaves and the number, the width of leaves and the number around the stem and the length of the leaf and the vertical distance between leaves on the stem. Thus, when leaves are large and still numerous, they are likely to be more or less lobed or divided so that the light may sift through and reach the lower ones, as in the common ragweed. When the leaves are narrow, there is compensation in an increased number of vertical rows so that the number is increased to compensate for the smaller amount of surface in each leaf. This is beautifully shown in the common weed called horse-weed (*Erigeron canadense*). Our pines produce many leaves, nor are the leaves lobed in the least; but they are very small so that the light may sift through as they are blown in the wind, and they are of a form which presents little surface in proportion to the mass of the leaf. Also the so-called breathing pores are not numerous, and the trees are on the whole adpated to dry conditions. Thus where the plant finds it to its advantage to tower above every other form of vegetation, it may take a method of adaptation to dryness quite different from that shown in the rosette habit.

Passing to stems, the function seems to be to get as many and as good leaves as the plant may need and to get them up into the light, and finally to produce as many flowers, fruits and seeds as may be needed for the distribution and continuance of the species. Man sometimes tries to produce stems for the purpose of getting wood for various purposes, and he may well afford to put into his soil the elements necessary for the production of just the grain stem needed, neither so rank that it cannot stand until the crop is harvested, nor so weak that it cannot stand though not too rank. In nature some stems are strong enough to stand and perform their functions year after year, others simply stand long enough to produce a single crop of fruit and then fall, while still others have found a way of getting up into the air without building a strong stem. This is seen in the common climbers and twiners as smilax, grapes, Virginia creepers, morning glories and many other plants, some of which are annuals while others have more enduring stems, though still too weak to do their work unsupported. This peculiar adaptation is shown to best advantage in the tropics where the shade of the tropical forests is more dense and the climbing habit more necessary. When these weaklings grow up over other stronger plants, they frequently reach the very top and spread their leaves to the sun, thus taking the benefit of the honest work of the supporting plant, which is often greatly dwarfed and produces few leaves if not killed outright. Man improves on nature at this point, in that he does not allow his climbers and twiners of the garden to grow over other useful plants, but uses various other contrivances instead. And, indeed, man seeks to produce the best fruit possible not usually for

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seed and continuance of the species, but mainly for his own use; and in this he may learn something from nature's way as to just what kind of a stem to produce and how to train it in order to accomplish his purpose best. Sometimes he will not follow nature, but will improve on her method. For instance in the case of the tomato, the wild plant with its low habit produces fruit good enough and plentiful enough for its purpose, but it does not follow that it is best to allow the cultivated varieties to grow naturally. The rank forms acquired by cultivation and selection have become a fair mark for certain fungal diseases when the fruit is allowed to develop in a moist and shaded position near the ground, and also the fruit-bearing surface may be greatly increased and the fruit developed in size by training the vines on poles, trimming them properly and carrying them up five or six feet into the air.

In the wild state, running stems as in the common strawberry trail over the usually rather dry and sterile soil and strike root here and there to get the limited amount of nourishment contained in the soil, and at the same time put up a cluster of new leaves just above the new roots, so that the nourishment absorbed from the soil may be transformed into plant food near at hand, the leaves in turn also shade the ground above the roots and help to retain the small amount of soil moisture. These plants are not especially in love with their environment, but grow here because somewhat adapted to the dry habitat, which is not so commonly overrun by other plants. But wild strawberries even will grow better vines and fruit wherever they can gain a foothold in moist or shaded places. So man does not follow the more common condition here, but plants his berry vines in more moist and fertile ground where they will not have to use so large a proportion of their total energy in the production of runners, but will produce better leaves and better fruit.

Finally, we may consider roots and their adaptations and draw some practical lessons. The root ordinarily attaches the plant to the soil, holds it up and absorbs water and food materials in solution. There are other secondary functions, among which the storing of food in the fleshy roots is perhaps most important. In order to come in contact with as much soil as possible the whole root, or at least the younger portions, is very slender, and these slender threads grow out in all directions and grapple as much soil as possible. Naturally, as the root system extends in trees the fine fibrous portions die away from day to day and as the tree grows form an ever widening zone farther and farther away from the base of the tree trunk, thus constantly coming into contact with new soil particles. Given a poor soil, the roots will penetrate farther for the necessary nourishment, and when the soil is dry the roots will elongate more to reach the moisture at a lower level in the soil.

Man, whether consciously or unconsciously, in the treatment of the roots of his cultivated plants follows nature more or less in certain particulars. Thus in a dry season he cultivates his corn often and hoes deep in the garden. This cuts off any young shoots which attempt to grow out laterally too near the surface, and the strength of the root system goes to the greater elongation of those growing downward to the moisture. Though seldom thought of, one may with as good reason stir the soil often and deep when the surface soil is worn out, and the stirring will send the roots down where

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there is more nourishment. On the other hand when one wishes to transplant trees of considerable size he does well to first cut all round the tree, cut off the tap root below and even make a trench all round the tree which should be filled at once This cutting off of the extremities of the roots causes the older and larger portions to put out numerous small fibers within small compass, and after the tree has again regained its equilibrium and has begun to grow, it may be transplanted at the proper season with an abundance of small fibrils ready to begin to take up nourishment almost at once. In this way trees have been transplanted from the woods and retransplanted one or more times and have actually grown faster than those of the same species left undisturbed.

We are wont to think that plants gr w wherever seeds happen to fall, but this is not at all true. The seeds may indeed germinate, but if the plant has not some of the special adaptations to the peculiar environment of the spot where the seed falls, the chances of life are very poor. Thus it happens that just as man plants certain trees on low soil, and others on high and dry, and sows the common grains where the conditions as to moisture are medium and flax and kaffir corn on dryer soils and in dryer climates, so the wild plants select for themselves. So it turns out that as we have distinct human communities as that of a college town, that of a mining town and that of a manufacturing town, just so we have various plant societies. And as the intelligent man gets some idea of a community when told the leading industry or general nature of the place, likewise can the well-informed botanist tell pretty closely the nature of the plant population as soon as he is told accurately the environmental conditions. Thus given a recently inundated and undisturbed mud flat anywhere in Iowa, he will predict the presence of Botrydium and Vaucheria and in a short time the Riccias will appear and somewhat later some of the common annual weeds. Few plants are prized more and at the same time so little known as the little thalloid Anthoceros, yet it is easily found in just the proper conditions on the drift or loess of every Iowa locality with which the writer is acquainted. Given a rock exposure of a certain kind, and there immediately comes to mind the lichens which may confidently be looked for on the rocks. Mention a desert, and we recall at once the Yuccas and the yet more characteristic Euphorbias and cactuses with their leaves transformed into prickles, their outer surface rendered stout and leathery to prevent too great an amount of transpiration of moisture and their internal reservoirs for storing water. Think of a region that is moist in spring but usually becomes dry in summer, and we at once recall the onions, radishes, many grasses and sedges, the blue-eyed grass, Hypoxis, the violets, blood-root and many other plants that put up their leaves and produce flowers and fruit early in spring so that they may lose the tender parts above ground later in the season without detriment. With these there naturally comes to mind the trees which can endure the summer's drought and furnish shelter for some of these more delicate plants later in the season. We also in this connection call to mind the sunflower, asters and golden-rods which spring up on our prairies in the later and dryer portion of the season and are especially noticeable on the dry and windy hilltops, these plants with their stout stems and tough exteriors, being especially adapted to such dry places and seasons.

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Man profits somewhat from what he sees in nature when he turns the wet mud flat over to the lowly plants named above till it becomes dry enough for his cultivated crops, when he plants his radishes, beets and turnips in spring or fall instead of in the hot and commonly dry summer season and when he leaves rocks and rocky places to the lichens and trees till these plants have succeeded in reducing the rocks to soil, aided of course by certain atmospheric agencies. Not only has man profited greatly by what is going on about him, but he is constantly changing plant societies, sometimes to his own detriment, and is also introducing plant societies of his own wherever he cultivates the soil and fosters certain plants, at the same time killing others by cultivation. Man's influence is seen also in cutting the forests, draining the fields and swamps, in irrigating, in transferring plants from place to place and even from continent to continent, in pasturing and plowing and in making roads and railroads. Indeed, man is changing the whole appearance of the country by his interference with existing plant societies and the introduction of new ones into every agricultural region. Nor is this all, for by draining and deforestation, he is even interfering with climatic conditions in a way often to his great disadvantage, and, in this matter of wild and cultivated plant societies are found some of the most important economic questions before our people.

Finally, we have passed in rapid survey some of the relations of a few of our native plants to natural conditions and have attempted to get some lessons from what occurs in nature. In so doing, we have only touched the very interesting question of plant societies and plant adaptations, and while man is supposed to improve on nature, yet we think that we have shown a few of the many ways in which he may profit from observation of what is going on about him.

THE PRESIDENT: You have this very practical paper before you now for discussion.

J. S. TRIGG: I would like to ask one question. I go out on the prairies of Dakota where nothing but Buffalo grass and perhaps two or three other varieties of grasses have grown for ages, and I plow up a piece of land and in two years I have a great variety of weeds entirely unknown in that section of country. Will you tell us where they come from?

PROFESSOR FINK: I think that question is one that is a great deal easier to ask than to answer correctly. The old superstition used to be that they just came spontaneously, just as the firs are supposed to come up in the pineries, and as the oaks come up after the fires in the pineries—spontaneously, without any seeds—and the question is as to where these seeds come from. I suppose they may have been there for some time, in some instances, and we all know that seeds are blown readily from place to place, and these seeds may have been there for years simply waiting for a chance to grow. It is claimed by

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some that the crows are responsible for the acorns being distributed in the pineries, and after the fire these seeds come up very readily. You probably have met with the experience of leaving a clean field one year and finding Russian thistles literally covering it the next year.

MR. TRIGG: That sounds just a little like the old superstition that a hair of a horse's mane will turn into a worm in his eye. Now you gentlemen that have the benefit of accumulated scientific experience, you ought to know where they come from; that is what you are paid for doing. It is guess, that is what it is. Of course I realize the very wonderful economy connected with the distribution of seeds, and yet it has always been a puzzle to me to know how these things came about.

PROFESSOR FINK: Railroad trains are largely responsible for the distribution of seeds and plants along the right of way.

MR. TRIGG: But the railroad is about forty-five miles distant.

THE PRESIDENT: I remember in early times, before there were any railroads, whenever you dug up a piece of wild sod, the first thing you would notice would be the tumble-weeds; if you burned up a brush pile there would come the pokeweed. Now I just thought that nature was wonderfully abundant in resources. The seed was there and when stimulated, grew right up. And I believe it is so all over in nature, whenever the environment, conditions, moisture and heat are present, there is growth.

PROFESSOR MACBRIDE: I believe I should have answered Mr. Trigg's question by asking him one. If he will tell me what particular weed he refers to, I will tell him how it got there.

MR. TRIGG: I have the disadvantage of not being a botanist and I cannot roll off these scientific names. But I do know this when you plow a piece of new prairie soil an entirely new form of vegetable life will take possession of the soil, new types of plant life. My opinion is they are like original sin, go on all the time.

MT. FRAMPTON: Up in Boone county there are a few little ledges in the timber where this wild cedar seems to be native, and has been for years. Of late years they have grown up and the seed has been scattered all through our county. The young seedlings are coming up and many of the homes along the Des

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Moines river from here to Boone are lined with them; they have been scattered by the birds from this little point away up in the timber.

MR. TRIGG: That is easy to understand, but in this country there were no birds, except gophers, and you can't work the bird distribution theory on it at all. Birds explain pokeweed and a great variety of our common seeds, but when you get out into Dakota, with its limitless prairies, it don't seem that birds ever had any business there, and you can hardly imagine that the wind would transport the various kinds of solid seeds that distance.

PROFESSOR MACBRIDE: I am satisfied from personal observation that solid seed can be carried by the wind a great ways, more especially when there is snow. Sometimes you can see it going, seeds that would ordinarily not be carried by the wind, have a chance to be shoved along over the snows.

MR. BURNAP: I just want to say that if Mr. Trigg has been out in Dakota beyond the limits of bird life, he has done a good deal more than I have. I do not believe there is a place in the United States where there is a cover of vegetation, where there is not a species of bird life.

CAPTAIN WATROUS: It seems to me that this is practically all about nothing. I do not believe there is any practical question in this. I do not think Mr. Trigg would like to stand up here and say that he believes plant life comes upon newly broken ground without the intervention of seeds in the natural way. I do not think that he believes that, and the question of how the seed of a particular plant arrives at a particular place is a matter of no very large consequence; whether it be carried by the wind or whether it was carried there by one or another bird, or some other animal. I do not think any man here has the slightest idea that the plant grows up without the seed having got there in some natural way. For instance, if one should take a box of earth and subject it to a great heat for a length of time so that any seed in it would certainly be killed, and then seal it up, I do not have any idea that any man here believes that plants would grow out of that sterilized earth. I think that is about all there is in this question.

THE PRESIDENT: I take it that we do not want to take an orthodox view of this matter, and while the discussion has been along interesting lines, we will now have the next paper,

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entitled, "Tree Planting in Northwestern Iowa," by Prof. B. Shimek, of Iowa City.

(Paper not received; may appear in report later.—Secretary.)

THE PRESIDENT: The reading of this paper has consumed all the time up to adjournment, and I wish to say that we will have a good program this afternoon in joint session with the Park and Forestry Association, and you all want to be here, and perhaps the paper just read by Professor Shimek can be taken up for discussion this afternoon.

We have with us a delegate from Wisconsin, and I will call upon Prof. E. P. Sandsten, of Madison.

PROFESSOR SANDSTEN: I am sure that I am glad to be with you—that is the usual thing to say, is it not? I wish to assure you that I came down here to learn new things. We are younger than you are and we know less than you do. We have, of course, some older members, but we have more younger than you have, and I am here to gather up all I can to take home with me, so that I am here in the capacity of a listener and I shall try to take in what you have to say.

THE PRESIDENT: If there is no farther business, we will now adjourn until 1:30 this afternoon.

TUESDAY AFTERNOON SESSION.

Prof. T. H. Macbride in the chair.

THE PRESIDENT: We will now come to order. In the regular order of things Mr. Wragg, president of the Horticultural Society, should have been here to call us to order, but in his absence I will endeavor to do so and take up the business of the session at the point we left it before adjournment. The last paper was by Professor Shimek and the order before adjournment was that at the opening of this afternoon's session the paper would be up for discussion, and the paper is now before you for that purpose.

MR. BURNAP: I would like to ask whether it is a fact that hickory can be considered a good tree for cultivation in northwestern Iowa. In his remarks he recommended hickory as being desirable to plant there.

PROFESSOR SHIMEK: I stated that so far as hickory is concerned it would probably be a good while before we developed conditions in that section so that they can be grown successfully.

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They are likely to do first rate in open places, but it cannot at this time be expected that they could be cultivated on any large scale.

MR. HATFIELD: He spoke in the paper, I believe, of the land being used for corn land only. Now we can raise trees to a larger profit than we can corn. I know this from experience, and I know that we can get $27 a year annually from planting trees in northwestern Iowa. I have proved it by using the material. Take walnuts, for instance, on bottom lands – of course we will not take any high land for them—it will take about twenty-seven hundred trees to the acre. Let them grow eight years and then you can cut every other tree out and you have posts worth 15 cents each. If any of you can rent your ground and have it bring that rental with corn, I would like to see it done. I have myself sawed 37,000 feet of cottonwood lumber from one single row of trees 140 rods long. Another thing, the coal strikes and coal hauling and things of that kind never interfere with my business at all. It brings plenty of fuel. I have not burned a ton of coal in eighteen years for cooking or heating purposes, and I have never had at one time more than three acres of timber. Can you get three acres of corn land that you can get that much out of? Of course, this matter must be followed up. You can't get returns quick like you can on some other things, but if you can afford to wait for returns there is good money in it.

THE PRESIDENT: I think it entirely proper to ask where Mr. Hatfield comes from.

MR. HATFIELD: I am from Woodbury county. Now you can care for your cottonwood lumber so that it will keep straight by packing it in a body and let it lay there sixty or eighty days, which brings out the acid and there comes a white mold between the boards and then you take it and strip it and you can lay this lumber around just as long as you please and it will keep straight. If we can get the acid out we have good lumber and it is better lumber than any pine for inside work.

PROFESSOR FINK: I think it essential that we get these remarks embodied in the report just as the statement is made. The statements of a man who has had actual experience is often worth more than what appears in a paper. So many statements are made to the effect that it is worth while to plant trees for the profit to be derived therefrom. Now here is a man from north-

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western Iowa, from a section where it is not supposed that trees grow very well, and he says that trees for the purpose of profit are worth more than corn.

MR. HATFIELD: I think there is a paper in the 1902 report of the Horticultural Society giving the value as $29.00 an acre, and the timber was twenty-five years old.

MR. FORSTER: You take it down in Monroe county and the walnut is counted worthless. Now as to cottonwood lumber, twenty-seven years ago I moved 10,000 feet from the south part of the county to where I now live. It went through a sweat, and in the spring I blocked it up, and as I needed it I would distribute it around on the place and use it for fencing. The most of that lumber remained straight, and the moisture didn't seem to affect it.

MR. BURNAP: The gentleman remarked about walnut, had you reference to black walnut?

MR. FORSTER: Yes, sir.

MR. BURNAP: That is a different experience from what we have in our section of the country. We think it stays there quite well.

MR. HATFIELD: I put out some black walnut posts on my farm twenty-seven years ago and they are there today.

THE PRESIDENT: I now have the honor of introducing Mr. Nutter, of Minneapolis, who will address you upon the subject of "Parks for Small Cities and Villages."

PARKS FOR SMALL CITIES AND VILLAGES.

BY FRANK H. NUTTER, MINNEAPOLIS, MINN.

It is only of comparatively recent years that a question such as this has been considered worthy of consideration. I can easily recall the time when Central park in New York was the only completed park in the country, though Fairmont park in Philadelphia and Prospect park in Brooklyn were beginning to be talked about. About all the available park literature was that which treated of the "parks and promenades" of Paris. Unless the student was so unusually fortunate as to secure a set of the Central park reports which their being in part, at least, from the pen of Fred Law Olmstead, were and always will be classic in this line.

Later when a system of public parks for the city of Boston was first proposed it required much agitation and discussion in public meetings and in the papers before the opposition of those who claimed that the historic "Com-

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mon" and "Public Garden" were sufficient for all present or future needs could be overcome and the efforts of the promotors crowned with success.

It is interesting to note how much space, even then, was given up in the early reports of the park commissioners to prove by statistics and carefully prepared tables that the cost of the proposed parks would be met by the increased valuations and larger tax receipts and so the investment be, from a financial point, a profitable one.

Going back to the early years of the park improvements as now established in most any city we find the same or similar statistics employed to encourage the public to carry forward the good work. Even in our own city of Minneapolis the first reports of the park board contained the same old story.

While it is true that in every case experience has proven the truth of the claims of the early park advocates, I do not think we hear quite as much of this line of argument at present. For one reason the public mind has been educated up to a reasonably full appreciation of the investment side of the question and I hope that we may also claim that many of our fellow citizens are beginning to recognize a higher fact, that doubtless all here are ready to admit, that there are more important demands to be met than those which are expressed in the sordid symbols of dollars and cents.

Sewers and waterworks are eagerly demanded not solely as a financial investment, though they may serve as such, but because they advance our physical comfort and safety; schools, libraries and art galleries are fostered from the public treasuries not for the percentage of profit shown in the yearly balance, but for the building up of the minds of their patrons, and so promoting a higher citizenship; and parks are now being established throughout the land because while they may and do add to the value of real estate, they will, in the quiet contact with nature which they do or should afford extend a soothing influence to the wearied body and anxious mind distracted with the worries of daily life and labors.

In the writings of the elder Olmsted we find this thought of the functions of parks set forth often in varied but emphatic words.

While it might seem that this argument would apply with most force to large cities where the population is very congested and all thoughts and hints of nature and country crowded out, still I will venture to assert that not only in the large cities, but also in the smaller municipalities and villages and even in many of our country and farm homes the demon of unrest and pressure of modern life and business has found a shelter, and needs exorcising.

The necessity of a park being admitted, the question of location and methods of improvement and construction of the same arise for consideration.

Of course financial conditions must always be taken into account, and in park affairs as in all others we must "cut our garment according to our cloth," and if in what I say further I seem to pay little attention to this fact I will justify myself by saying that a tract of land selected with special regard for its adaptability to park purposes will almost invariably be the cheapest to improve and maintain, and frequently the most economical in first cost for land.

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I will also, at the risk of being considered not entirely disinterested, suggest that the securing of expert advice as to the location of the park tract and the logical boundaries of the same will not be an extravagance, but usually in the line of strict economy.

In the East old-established property and road-lines and in the West section and other sub-divisional lines, or if in a city the set lines of a rectangular platting, are almost regarded as sacred and are too often adhered to in the purchasing of park sites, to the future discomfiture of the one who would improve them along artistic lines, for it is often discovered too late that some small tract very essential to the proper development of the park design lies just outside the established boundaries, or perhaps that included within the lines of the purchase is an area which could be disposed of to the manifest betterment of the planning.

Laws have been proposed in some of our states requiring those platting town sites in the future to set apart a certain portion of the land for park purposes. This certainly indicates a great advance in public opinion, but from an artistic standpoint I could wish that the law should read that the boundaries of the park should be selected to conform to the topography of the ground and the rest of the platting made conformable thereto.

Often if a park could be properly laid out as a starting point of a town site and the lots platted around it, most striking effects would be secured and money saved.

I recall one flourishing Minnesota village through which runs a ravine, carrying some water at certain seasons of the year and with prettily wooded slopes. The streets cross it, to be filled at considerable expense, culverts have to be maintained. It is a dumping ground for careless and untidy neighbors, and so an eyesore and menace to public health.

Let us, however, rearrange the plat, encircling either edge of the bluffs with a winding roadway, face the buildings toward the ravine instead of away from it, carefully attend to the trees and shrubs on the steep slopes, and bring a footpath along the side of the little brook and do we not have a transformation worth much to the town, and actually at a saving of trouble and expense.

In many a place this experience might be repeated and to any municipality considering the subject of parks I would say make first a careful inventory of your waste lands, those which menace the health of the future city, which uncared for will become dumping grounds or the resort of squatters and a lawless population or which from their broken and irregular surface can only at great expense be made available for building purposes, for here in all probability you will find a location for a most picturesque park and the section which threatens evil will instead minister good to the people.

I could mention several cities which are intersected by small streams, the banks of which are as usually in the case, decorated with ash heaps and rubbish piles and becoming the slums of the place where at the cost of purchasing a small strip of land on either side, and a nominal appropriation for cleaning up, building foot-paths and caring for and adding somewhat to natural growth along the banks, a great work could be done for the advancement of the moral and physical health of the place.

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To some this method of selecting a park area would seem very foolish and would receive their strong opposition. In one of our Minnesota cities having a long stretch of river banks such as I have been describing, and a part of which has been recently secured, there were citizens who urged instead of this the purchase of a tract of prairie land adjacent to the town, which seemed to appeal to them from the fact that it was perfectly level and expressionless. When the purchase of what has been made one of the most attractive and picturesque of the smaller parks of Minneapolis was first suggested I heard it opposed in public meeting by a prominent citizen on the ground that it was a rough, hilly spot, good for nothing but to raise scrub oaks and mosquitoes, while there was plenty of nice level ground near at hand which could be bought just as well.

The designing of the park area will be governed by several factors, First, perhaps the financial conditions which do exist and which may exist in the future, for the cost of maintenance is one that must be met annually, and will be influenced greatly by what is done at the outset.

If the design be a simple one and the construction work be thoroughly done in the first place the yearly requirements will be at a minimum; if on the other hand, the planning of the work be intricate, with unnecessary paths and drives and architectural devices, or the work of construction be flimsily done, the maintenance fund will have to be largely increased.

The uses to which a park will be put must always govern to a great extent the details of its planning.

In some localities a playground may be demanded, with acoommodations for athletics and field sports. This is a want which should receive due attention, and even in small villages it will often be found that the young folks are forced to find their playgrounds in the streets for want of proper accommodations elsewhere. This is often to their own detriment and to the discomfort of the passers-by. I would advocate the establishment in every city or village of suitable playgrounds with proper accessories and under careful supervision, that they may be safe to all, but except in instances, when the park is of unusually large size, they should be separate and apart from the park proper, for the noise and excitement of the players will destroy to a great extent the restful quiet that the other visitors will desire.

A park that is to be the resort of large crowds of pleasure seekers and picnickers must be planned on a broad scale; it should have ample expanse of lawns or groves, and if carriages are many, of drives and concourses also; and however much we may regret it from artistic reasons simply, the buildings, walks, walls and stairways must be sufficient to care for the crowds safely and conveniently.

On the other hand a park that presents attractive phases of natural scenery, or perhaps is established to protect some place of historic or local interest, and which is not likely to be overcrowded, should, as far as possible, be kept free from artificial adornments, the paths and drives be as few and unobtrusive as possible, the sole thought being to do only what is necessary to introduce the visitor to what may be called the "inner self" of the park.

Parks that are surrounded by buildings may at times be treated in an architectural manner to harmonize with their environments, and if this be not attempted, a more strictly geometrical design will be usually appropriate, though sometimes if the park surface be considerably broken, mos-

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charmingly picturesque effects may be secured on a very small area, espect ially if water can be introduced into the scheme.

One particular feature of park work now receiving considerable attention is the treatment of the surroundings of the railroad station and while this rarely can in any way supersede the parks proper of a town, still it is a matter that will well repay public interest. Most visitors approach a town by railroad, and so get first impressions which are far from favorable. At our homes we would hesitate to introduce a guest otherwise than by the front door but in entering many a village by rail we feel that we are not only being led in by the back door, but through the barnyard as well.

In our western country we are sometimes called upon to make our park of a tract of land which is bare of all trees and shrubs, and perhaps of a monotonous level surface also. Here our landscape must be made of course, not merely preserved and improved, and we must depend mostly on the nurseries for our working materials. From artistic reasons, to afford a background to our prospective picture, and from climatic reasons to furnish needed protection, the border plantations must be made thick and heavy, but with an irregular fringe of smaller trees and shrubs to break up the shelter belt effect. Within this frame we must work up our picture proper. For this we must use principally native trees and shrubs or those cultivated varieties which we know are entirely hardy in the locality and soil to be improved. Most of our work having been done with these we can begin to experiment a little, knowing that failure here can work but little disaster, while a park manager who can successfully raise a group of rare trees or shrubs has accomplished something which may make his park celebrated, locally at least, long after he is gone.

The use of foliage plants, artificial constructions and the like, gaudy colored beds, etc., are often introduced into parks with rather disturbing effect to the artistic eye. To be sure the people enjoy the flowers and plants and their tastes should be gratified, and the better way to do this, as it seems to me, is to set apart some section of the grounds for this special purpose and make it distinctly a flower garden. As for the wonderful clocks, globes and other constructions of the mechanical gardener they are often very ingenious and excite a certain kind of admiration in the visitor's mind, but I doubt if they appeal very much to the true love of nature. I am reminded of a remark I heard once on a time. A group of women were looking at a structure of this kind supposed to represent the "Gates Ajar" and one of them said, "Do you know, whenever I look at that, I just want to walk up them steps!"

Some varieties of the hardy perennials, as the golden glow, hardy lilies, larkspur, phlox, etc., may often be used with fine effect in connection with the shrubberies, affording color effects impossible with the shrubs alone, and giving masses of bloom at times when their more aristocratic relatives are resting upon their laurels.

I know not whether in this rather rambling and disconnected paper I have added anything of value to our considerations today, but I will thus summarize my advice to any municipality that is discussing the subject of parks.

Parks are now becoming a necessity of modern life, and the city or town that does not as soon as possible provide suitable areas to be sooner or later developed as parks, is neglecting its duty to present and future generations.

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It, however, should not attempt to pattern too closely after what some other city has accomplished but should study the question from the standpoint of its own needs, advantages and disadvantages.

It should examine closely its own possessions and see what they offer for improvement, and careful thought and perhaps the assistance of a trained eye and mind may show that it is much richer in opportunities than it had realized, and at last its people may acknowledge the truth of the old adage that "familiarity breeds contempt," and gladly heed the poet's admonition,

"That is best that lieth nearest,
Shape from that thy work of art."

THE PRESIDENT: I might say that Mr. Nutter is here as the representative of the Minnesota Horticultural Society, and we welcome him in the same full measure that he has contributed to our interest this afternoon. His able paper is before you for discussion.

MR. BOMBERGER: I would like to ask the question—I do not of course desire to turn the attention of the organization from the context of the paper—but what right has the public and what rights have the corporations with regard to wires and the injury that is done by cutting trees to accommodate these different companies? Is there any decision in this particular regard?

PROFESSOR MACBRIDE: That is a matter to which I have given some little attention. I might say that the legislative committee is receiving some reports in which the same question is involved. I find that our statute provides for the prevention of the destruction of trees in cases of that kind without consent of the owner in two ways, but the trouble is that people do not as a rule know it. There are decisions that clearly protect the rights of individuals in that respect if the owner is not willing to have the same removed. No road supervisor can interfere with a tree if that tree does not directly obstruct the right of way, unless it is absolutely necessary for deep grading, but unless that is the case the road supervisor has no right to remove a tree from in front of a man's place. The main difficulty is that the corporations or their representatives bluff people; they tell them that they have the right by law to do this. I know of one instance in Iowa City where the telephone lines suddenly take a diagonal cut across the street simply because the owner of the property on the west side of the street objected to having his trees mutilated, and told them he would see that his rights would be enforced, and they very quickly changed the course of the lines. The employes of the corporation often come and

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destroy the trees in the absence of the owner, but if people would just enforce their rights, I think these corporations would very quickly quit mutilating the trees. The present laws are sufficient, and the only thing necessary is more sand and backbone on the part of the owners and a little more knowledge of the facts of the matter. I think if a little more knowledge was at hand the backbone and sand would be found.

MR. BOMBERGER: In the country I think it is pretty well understood as to the control of trees as far as they do not interfere with the traveler, but the general impression is in our city, as well as other sections of the state, that when it comes to the city, why the town council is the whole thing, and these corporations you speak of if they can make some arrangement with the town council the citizen has practically no rights after that arrangement is made with the corporation.

PROFESSOR SHIMEK: I would like to say that the city council has the right to establish certain rules by ordinance that control in all cases. I am not a lawyer, but I have looked into it and found that the city council has the right by ordinance to decide how trees shall be planted and to make certain regulations regarding their care. If you have trees in front of your premises and the destruction of these is not absolutely necessary for the improvement of the real right of way, they have no right to interfere. Mr. President, perhaps you remember the details in the Dr. Hobbs case at Iowa City. The city council undertook to effect a change of grade in his vicinity that would have meant the destruction of the trees. He went into court, and the trees stood. The city council has no right to interfere. They come under the same rule and law that the board of supervisors do; they have certain powers, but these powers are restricted. As a matter of fact, the principle is exactly the same for city councils as it is for the road supervisors.

MR. NUTTER: I might say in answer to the question that the park board of Minneapolis, by the section of the charter which makes them the Park Commission, is directly empowered to take charge of all street trees and no trees can be removed without written permission. Now, with us, we have not so much trouble with the wire stringers as we have with the building movers, where a frame building, worth probably fifty or sixty dollars, is to be moved and it involves the destruction of several hundred dollars worth of trees. We fought that question out there and

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went to the supreme court, and it was decided that the Park Commission has full power in the matter of protection of street trees, even if the exercising of it absolutely prevented the moving of a building through the streets.

The supreme court has also decided that so far as the city of Minneapolis is concerned, they cannot mutilate a tree without permission of the park board. Now the park board of Minneapolis have set out trees, under a special section in the charter which enables them to do that, and assess the cost against abutting property. They set out these trees very carefully and the trees are cared for and watered for three years. If at the end of three years any of them are dead, they are replaced. Up to the present year they charged five dollars a tree, but that really is not enough to cover the actual expense. This year they have made the price seven dollars, I think it was, for the cheaper trees and ten dollars in that part of the city where it was very expensive. In doing this it has sometimes been very difficult to locate the trees to avoid past improvements. We have always been very careful not to touch a tree that a man has set out if it was at all respectable.

THE PRESIDENT: If there are no further remarks we will pass to the next paper on the program, and I will call on Mr. O. H. Carpenter, whose address is entitled "The Architect and Landscape Artist."

THE ARCHITECT AND LANDSCAPE ARTIST.

BY O. H. CARPENTER, IOWA CITY.

I have looked forward to the time when the public would be educated to the needs of landscape artists to assist the architects in their work, and while the time may not be ripe for the architect to insist that his clients employ a landscape artist to assist him in making his estate more homelike and artistic, or even develop the client's own tastes, should he have any, still we should put forth every effort to educate the public to that point.

The class of buildings now being erected show great improvement in design and adaptability to the uses to which they are put. Our designs may be somewhat heterogenous and indiscriminate, still they are not as heterogenous and indiscriminate as they used to be.

Solutions of special architectural problems and landscape architecture have been worked out with reasonable success, and it is encouraging to note that these designs, while not strictly American, or typical of American life, have some measure of propriety. If we can but develop a purely American style, one that will portray American life, we shall indeed be fortunate;

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and when we do, we must rely in no small measure upon the landscape artist to assist us in securing a proper setting for these works of art.

In some parts of our country, estates both large and small, have been established in which landscape artists have been given instructions to lay out formal gardens with a view to the proper setting of a beautiful house and outbuildings; and in some instances, the artist has followed the instructions of his client, and the result is jarring to the lover of true nature. Imagine, if you will, a formal garden laid out amidst the glorious surrounding nature (such conditions do exist), with its beautiful, native trees, plants, and contour of the ground which, if the artist had been allowed to utilize the natural beauty of the ground and its trees, plants and shrubs native to the locality, he would have given his client a bit of landscape both enduring and restful, and appropriate to the locality.

I ask your attention to a few considerations on the function of landscape artist and architect and their places in our lives.

No intelligent person can deny that the externals of our material environments exert a tremendous influence upon us; beautiful buildings well set in lawns and parks delight us, while mean, vulgar creations with little or no landscape are offensive.

Consider how much space and sky you can secure when you are about to erect a home. You may get these in vacant city lots, but in this age of cheap transportation one should not allow himself to be hemmed in by a 50x150 bit of this great, broad earth. Get out where space and sky are plentiful, the more you get the better you will enjoy life, provided you have builded wisely and surrounded that home with a well laid out lawn. Tell your architect and artist what you think you want and then let them assist nature in making the surroundings beautiful.

Another section of this subject in which our duty is not so clear is that relating to the style and arrangement of setting in our domestic architecture; individualism is a great thing to which we owe most of our liberties, much of our progress, but it has wrought some results not altogether commendable.

It has obscured the debt of the individual to the community by emphasizing the absoluteness of his control over his property. He exercises his own tastes to a great extent in the location of his home; he may, and frequently does, place his house in such a position as to utterly spoil that of his neighbors as well as the vista of the street. He seldom, if ever, consults the landscape artist, as there is no law controlling the location of his home. He generally succeeds in destroying what natural beauty there is in the block, and if it be not a block but a suburban site, he will build his home on the very highest point of the plot of ground in his possession, and then perhaps he will realize that he has not been successful and will call for the services of the landscape artist to help him out of a bad mess.

The state exercises no control over the artistic character of the design. This, perhaps, is wise, for art flourishes best under open competition, and official restriction is dangerous, but, while the owner is legally free to act in the matter as he pleases, he is not morally. He owes a debt to the public and that debt should be paid off by the improvement and beautifying of his estate, be it either city or suburban home. To affront the public with a brutal and vulgar design is an insult to his benefactors.

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When one has decided to build, he should by all means call to his aid the services of a landscape artist to assist him and the architect in locating his home. It is necessary that the landscape artist have a set of plans of the house that he may lay out his lawns and gardens to conform to the arrangement, style and location of the house

Go where you will in this country and you will see the ugly village of a type peculiar to the locality. In the South you see the low squat house with wide verandas, and if the owners are Germans, you will see a few flowers, but in most cases only sand or gumbo will greet you.

In the Eastern village the owner sets his cottage, or for that matter, his more pretentious residence on a line with the street and runs his steps out on the walk. The Western owner has any quantity of ground and air but does not utilize his natural advantages either because he does not know how, or has not the time and it is usually the latter. He may be content with his dugout, or if in the city with a more pretentious house on a broad and dusty street.

It would be easy to particularize the many beautiful elements that render discord in our villages, or cities for that matter—it would be quite different to specify the causes of all the ugliness, but I will pass this by and come to the question—how can we improve the appearance of our villages? In the first place the separate properties in each village are usually owned by the tenant and so therefore must begin at home. The smallest lot usually betrays its owner's tidiness. If we could but organize societies in each city and village who would by their example and influence, educate their neighbors to appreciate the higher ideals in landscape architecture, we would be a long way on our road to betterment of our several communities. In some parts of our country this has been successful inasmuch as the farmers have removed the many offensive signs from their buildings and fences, and in their places tacked up neat signs—"Post no bills."

The work of the landscape artist and the architect are sister artists but in their progress toward perfectness, building is in the lead. We put more study in our buildings than in their surroundings, for most persons are quite ignorant of the possibilities of artistic work with earth, grass and foliage. There are good reasons for this. Where we have acquired a competency we have passed that period in our lives where we enjoyed the outdoor life and its beauties, and unless we can force ourselves to journey back to the days of our youth and forget our technical knowledge we will content ourselves with row on row of straight-faced stately or otherwise buildings.

We lay our streets with the sun, plat our cities as if they were so many cubes and for the very reason that we cannot get past the idea that it is so much more convenient just as we sit on a stool before a lunch counter because it is more convenient—and if we live that way with no thought for the beauties of nature that could be at our hand for the asking, we miss many of its joys that might be ours. We can secure just as beautiful surroundings for our buildings as you can find in older countries, but if we want it, we shall have to work for it through that arduous process called designing. In the beginning we must picture to ourselves the end and our constant aim must be to make all that we do contribute to the effect of the whole, and the whole can never be the building only. The site, the scene, the landscape

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and the building must be studied as one design and composition. There is no other way of winning the beauty we desire.

THE PRESIDENT: The paper is before you for discussion and inquiry.

MR. NUTTER: I am glad that the gentleman takes the stand that he does, for I do not only claim that the architect needs the landscape man, but I also claim the landscape man needs the architect in order to obtain the best results. If they do not work together it is likely to resemble a badly-trained span of horses, one pulling one way and the other another. There are many little points that perhaps an architect may not notice but which affect very materially the final results. It is a fact, however, that the question as to what will become of the grounds is left to the very last, when really it should be about the first thing, if the house is to show the real worth of the architect.

DOCTOR LUMMIS: When I hear folks talk about laying out grounds it makes me shudder. Now I have a notion that when you undertake to ornament nature, you are generally a failure, and I do know that in the decoration of grounds and in laying them out, platting for the house or mansion, it is the pleasant surprises that make the value of the ornamentation and decoration. Now to employ a man to lay out your grounds like the wealthy people do—I just read an article in the paper last night telling that Vanderbilt paid fifty thousand dollars for an architect, and I don't want to see the place. I know myself there is no natural art in it. I am not fond of pictures of that sort. Now here are the people of New York, they ought to know something about this matter, and they determined years ago that they would not expend, nor have any more ornamentation and decoration in Central park than was absolutely necessary for accommodation, and when you enter that park you find little brooks here and there, stones that have never been moved and paths made only by nature, and you come across what I did, the Julip weed. It is these surprises in nature that please and our architects can only imitate, and when their work is done it is generally unsatisfactory.

MR. FULMER: The remarks of my good friend remind me of an article I read not long since which was by one of our best writers and he was commenting on the fault found along these same lines. I do not know as I can give it in detail, but the article was like this: If you are going to do away with land-

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scape gardeners because you think it against nature, don't ever get a shave or a hair cut.

MR. NUTTER: My friend speaking here in opposition to the landscape man is not alone in this world. Up north a party offered quite a large tract of land near Lake Minnetonka to the commissioners if they would promise that a landscape architect should never be allowed inside of the fence. They wanted to preserve nature. I do not think we are all quite so bad as they try to make it, however. I dislike these false attempts as much as anybody. Speaking of Central park, in New York, that is about as fine an exhibition of nature as we can see anywhere, and the only thing we can say in regard to that, is that when that was taken in hand, it was a barren mass of rocks and hills occupied by squatters, and this picture of nature that has been so graphically described to us was the work of the greatest landscape architect that ever lived in this world or in any other.

MR. S. H. LINTON: It is out of the question to undertake to represent nature, and when I look at these artificial parks I see at a glance that it is but an attempt to feign nature. I admire a systematic orderly park as much as anybody, but it is only a representation at the very best, and it cannot be otherwise.

THE PRESIDENT: If there are no further remarks we will now listen to an address by Rev. D. W. Wylie, entitled "Outdoor Art and Morals."

THE PRESIDENT: The paper is before you for discussion. Are there any remarks or queries? If not, we will pass from the more theoretical part of our program to that which is more practical. I have the pleasure to call on Professor Shimek of the State University of Iowa, who will give us a paper on "Native Shrubs of Iowa."

[Paper not received, may appear in the report later—*Secretary*.]

THE PRESIDENT: The paper is now before you for discussion.

MR. WATROUS: I want to call attention to one thing in regard to the Virginia Creeper. We have two sorts of Virginia Creepers, and it may not be known to every one that there is one that is very much like the Japanese Creeper, and if you will get that species instead of the common Virginia, it will do very much better for brick walls.

DOCTOR LUMMIS: I would like to ask as to the varieties of the Moonseed and where it is found in Iowa?

PROFESSOR SHIMEK: In almost any grove in the State. I have not visited a county in which the Moonseed does not grow. The paper gives in detail the varieties.

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MR. WATROUS: If you will go down Seventh street, before you come to the 'Coon river, on the left hand side, there is a spot where there is plenty of this Moonseed, and in two or three places among my evergreens.

A MEMBER: Speaking of the Virginia Creeper, I want to add that if you once get it you are likely to have it forever. I have known of it in several places where it was a notorious nuisance. I have seen the time when I would give considerable money if I could get rid of it, and I would caution people to plant it where they can control it.

PROFESSOR SHIMEK: I think that is true and of more than this particular one. The fact is that such plants as Sumach may become a nuisance, as well as many others, when out of place. But the thing to watch in making use of shrubbery is to exercise care in selecting a place for them. These shrubs are not suitable for all places.

DOCTOR LUMMIS: I would like to add to Professor Shimek's list for ornamentation; in different seasons of the year the *Cornus stricta*, which is really beautiful in the winter time. There is one up on Pleasant street, near Dr. Hill's home, and one on Seventh street, near Crocker, and they are really beautiful in the winter.

PROFESSOR SHIMEK: That is included in the paper.

THE PRESIDENT: We have on our program further papers and while we are waiting for the arrival of those who are to present them, I will call on Mr. Secor, who is always on the program, whether it is printed or not.

MR. SECOR: I will ask to be excused at this time. I never talk upon any subject that I am not prepared upon and I have given no thought at all to anything in connection with this particular subject. While I love the trees, flowers and shrubs, and would urge their cultivation so far as they will do in our climate, I am not prepared to talk on the subject in such a manner as would interest you this afternoon. There is one shrub that I might mention, the high bush cranberry, snowball. I presume the professor has seen it in this state.

PROFESSOR SHIMEK: That is included in the list given. It is a native of the State. I found it in Allamakee, Howard and other counties, and it is rather common in some places. The distribution of this native shrub is given in connection with the key.

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THE PRESIDENT: I am glad to announce that one of our speakers has arrived, and I have great pleasure in calling upon Miss Grace Troutner to present her paper entitled, "A Systematic Study of Trees in Our Public Schools."

A SYSTEMATIC STUDY OF TREES IN OUR PUBLIC SCHOOLS.

BY MISS GRACE TROUTNER, DES MOINES.

The heart of education, as of life itself, is purpose. To learn what is true in order to do what is right is the summing up of the whole duty of man. But Lowell says:

> "Who does his duty is a question,
> Too complex t› be solved by me.
> But he, I venture the suggestion,
> Does part of this, that plants a tree."

There seems to be a growing demand that everything should be taught from the standpoint of the practical in education. Therefore, simply to study trees is not enough. There should be a purpose in that study. Particular trees should be studied because they are worth knowing about, and particular facts should be learned because they have a bearing upon one's life. "Learning those things in nature that are best worth knowing to the end of doing those things that make life most worth living," has been expressed as the purpose of nature study. It surely applies to the study of trees. One of the best modern educators says that a child's first lesson should begin with the study of trees. (If this suggestion had been put into operation eight or ten years ago, we would not find five-sixths of the children who enter the high school today unable to tell an *oak* from an *elm* or a *linden* from a *pine*.) Zoroaster made the cultivation of trees a religious duty. The loss of reverence for trees goes with a loss of reverence for the beautiful. Only a *commercial age* could have sloughed off moral obligation to make the world beautiful and to preserve for the future "God's inarticulate children."

When the Pilgrims first landed in America, the almost universal forest was the remarkable feature of the scenery. In those solitudes the ax of the woodsman had never been heard, and for thousands of years the forests had been subject only to the actions of natural causes. To man, who had been accustomed to the open and cultivated plains of Europe, this waste of wood with its pathless wilderness and its inhabitants as savage as the aspect of the country, must have been equally sublime and terrible. But how soon did our ancestors learn that these noble trees proclaimed freedom from every branch and leaflet, and dispelled their solitude by gleams of civilization which they seemed to radiate. They supplied their fuel and lumber—the rare material which built their cities as well as every achievement of material progress the world has known to this day. From every point of view, the tree has been the most helpful friend of man. No other material agent has done so much for the human race and has been so recklessly used. But these conditions could not have been foreseen by our ancestors or they would have taken some measure to prevent their almost universal destruction.

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Theodore Roosevelt says that twenty years ago meeting for the care and protection of our trees would have been impossible; and again, that the success of home-making depends upon the wisdom with which the nation takes care of the forests. That seems a strong statement, but it is not too strong. In awakening and arousing an universal interest, we would strike directly at the public schools. The rest and growth of "Arbor Day" as a school enterprise has done much to develop a love for trees. But one day out of 365 is not sufficient to devote to a subject that touches the very heart of the material progress of a nation. Then too, one may strike wide of the purpose for which the day was set apart. The nature study work in the rural schools and the grades below the high school should be so systematized that in the end much practical good would result from their knowledge concerning trees. If we would teach as we teach facts in history that the tree gives to us tannin and coloring matter, turpentine and alcohol, rubber, oil, food and medicine, furnishing us with fuel and shelter; that they are soil reclaimers and retainers, that they help to hold the moisture and furnish wind-breaks, beside purifying the air, we might then lead the masses to understand the practical side of the study of trees. How may this be done? By creating the proper spirit among the patrons of the school district. By placing in the library of every schoolroom the reports of the Iowa Park and Forestry Association and other good books upon this subject. By placing in the hands of the ignorant teachers a "Hand-Book on Iowa trees." I can bespeak the willingness of the teacher, when she is once aroused to her duty to work unceasingly.

As we said we are certainly a commercial people and look not to the right or to the left, when we can turn material at hand into wealth. We have demanded of the tree, the sap, its very life blood; the bark, its very clothes; the roots, its only means of taking in substance in solution for its growth; its fruit, and yes, the tree itself and then murmur because it gave not more. This certainly is a lack of knowledge and appreciation. But the day is coming and not far distant when we can say as the Man of Galalee said, Peace be still for the Park and Forestry and the Horticultural societies of Iowa have awakened and aroused an universal interest in trees and thus it can be truly said, "Of all that is good, Iowa affords the best."

THE PRESIDENT: This paper is before you for remarks and inquiry.

Before taking up the next item of business the secretary has an announcement to make.

PROFESSOR PAMMEL: You perhaps know that several persons offered to give prizes for essays and papers on the subject of forestry. I have a half dozen papers from students of high schools, and I think it would be proper to refer this matter to a committee. I therefore move the appointment of a committee to pass and judge upon these papers.

Motion put and carried.

THE PRESIDENT: I will appoint as a committee Professor Erwin of Ames, Mr. Watrous and Professor Shimek.

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Are there any other items that the secretary has in mind at this time?

PROFESSOR PAMMEL: There is one other matter I wish to speak of and that is that we amend our constitution permitting life members on payment of five dollars.

A MEMBER: As I remember it we cannot make such amendment.

THE PRESIDENT: So far as I can learn from a hasty investigation, I find that the constitution may not be amended without thirty days notice has been given to members of the association. I wish that I might beg your permission to emphasize the matter of membership. I do not believe there is a man in the Horticultural or in the Park and Forestry Association that is not enthusiastically committed to the cause, and each one should be able to get five members for the association within the next week or two. If this could be done we would be perfectly independent within the next six months.

There being no further business before us the association stands adjourned until eight o'clock this evening at the auditorium of the West Des Moines High School.

Meeting adjourned.

WEDNESDAY FORENOON SESSION.

THE PRESIDENT: The time has arrived for taking up the morning program. The first in order, will be the reports of the directors from the various horticultural districts.

REPORT OF DIRECTOR OF THE FIRST DISTRICT.

BY C. G. BLODGETT, MOUNT PLEASANT.

I think that "variable" would pretty effectually cover the weather part of my report, but perhaps a few special points will not be amiss. The winter was pleasant with nothing unusual until about the middle of February. On the morning of about the 17th of that month the mercury stood at sixteen degrees below zero and in the advanced state of our peach buds they were all practically killed. In a few cases some partly developed seedling buds came straggling along into bloom about with the apple. Of the fruit, some rotted on the trees, what ripened were fine and of good flavor. I fear the

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buds are in the same precarious condition as last year. All else came through the winter in good shape, even red raspberries were alive to the tips. Indeed from a fruit-grower's standpoint of view all was bright and rosy until the night of April 29th there came a rain turning to snow and May 1st my weather record reads; frost, ice, and ground frozen. Many of our fruit trees were in full bloom and it seemed that the destruction would be complete.

The loss was most severe on cherries, owing no doubt in part to weakened condition of trees the previous seasons by wet weather.

Strawberries were also killed, but there were not many in bloom and the loss was small.

Apples were in bud and apparently were uninjured. The wonderful bloom that soon came out gave promise of a bountiful harvest but for some cause or causes the crop failed to fulfill our expectations.

A summary gives us: Apples, 50 per cent; pears, 5 per cent; peaches, 15 per cent; plum, 70 per cent; cherries, 45 per cent; blackberries, 50 per cent; raspberries, 60 per cent; strawberries, 100 per cent.

I think that a few more reports like the last three and we will have to revise our estimate.

The crop prospect is very good for the coming season only rain or snow is needed badly.

There surely is a growing interest in tree planting and never has there been better results obtained than the past season.

I may add for the encouragement of all that judging from the numerous recent inquiries on the subject that the people are awakening to the fact that there must be a more judicious selection of varieties, better care and attention in setting out and cultivation, if success follows. To the question, what is best to plant? My answer inveribly is "Iowa grown trees for Iowa orchards."

REPORT OF DIRECTOR OF THE SECOND DISTRICT.

BY A. BRANSON, NEW SHARON.

The winters of 1902 and 1903 were favorable for wintering fruit buds, and as spring opened all fruit trees showed a profusion of bloom, but when the freeze of April 30th and May 1st came, the cry came from all over the land, "The fruit crop is gone;" "Our fruit is all killed," etc. But notwithstanding this severe freeze, we were still hopeful of a partial crop. In answer to an inquiry received from the *Twentieth Century Farmer*, published at Omaha, Nebraska, we forwarded on May 4th the following communication, printed in the May 6th paper, 1903:

I have been fearful of great damage to our Iowa fruit crop after several mornings of three or four degrees below freezing, and a heavy freeze on the morning of May 1st, and about noon of this day I spent one and one-half hours examining the different kinds of fruits under a magnifying glass. This on low land, high land, low limbs and tops of trees, but was unable to distinguish but little difference, therefore I concluded the damage was not great. This morning (May 4th) I made another thorough examination and found but little damage in the apple and peach, slightly more in cherry, and still greater in the plums. (Yet the Burbank that opened its blossoms April 14th, appears to have set suffi-

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cient fruit for a good crop), and yet in all these kinds we feel confident that with our thirty-five years' experience there will be a fair crop of fruit provided we have favorable conditions from this time on. Grape stems killed on the new growth, and the leaves of the Catalpa tree are blackened. We consider that the low temperature following the freeze has been the great cause of our safety, each day has given sufficient sunshine for pollenization.

The investigation that called out this statement was very interesting, in looking into the open flower of the cherry and plum one can see the immature fruit, while in the peach blossom the fruit is in the upper part of a bell with cross bars at the opening so close that the fruit cannot be seen without breaking the flower, while in the apple bloom, the fruit is at the base of the flower.

The fruit crop in the Second District was variable. Some young orchards where insects were not so destructive produced fair crops of fine fruit. Ben Davis and Jonathan were most abundant. Prices for best apples were much above last year.

Scab prevails in most old orchards, some varieties were worthless for market. An effort should be made at the Farmers' Institute, to get orchardists and farmers interested in spraying, that our fruits may become more perfect.

As an estimate of the fruit crop we give the following: Apples, 20 per cent; plums, 25 per cent; cherries, 40 per cent; peaches, 75 per cent; grapes, 30 per cent; raspberries, 50 per cent; blackberries, 75 per cent.

REPORT OF DIRECTOR OF FOURTH DISTRICT.

BY WILLIAM LANGHAM, CEDAR RAPIDS.

This is the state of man: Today he puts forth the tender leaves of hope, tomorrow blossoms, and bears his blushing honors thick upon him. The third day comes a frost, a killing frost. *Shakespeare.*

Early this spring, I have no doubt that every director throughout the entire State was happy and confident that at this annual meeting of our society he would be able to report a year of great fruitfulness. The earliest estimates as tabulated and published by our secretary seemed to foreshadow such a result. But how the mighty figures have dwindled! Tell it not in Gath, publish it not in the streets of Askelon. When at the height and plenitude of our hopes and figures, came that blizzard in the last days of April, and from that hour began a retreat almost as disasterous as that of Napoleon from Moscow. By not letting conscience play a too important part in the calculations, we succeeded finally in figuring apples, summer, fall and winter bunched, at about 50 per cent, cherries lined up at 35 per cent, plums, pears and peaches were annihilated and swallowed up by the icy waters of the Berezina, only a few remnants and detachments returning to sunny France. In small fruit, black raspberries, currants and gooseberries, especially the two latter, were far below a full crop. Yet amidst the gloom, there were rifts in the clouds through which the sun was shining brilliantly. Red raspberries, blackberries and strawberries were never better. Strawberries for quantity and size should be marked 110 per cent at least.

Prices for all kinds of fruit were satisfactory throughout the season.

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Fungous diseases and insect enemies were in unusual evidence. The leaf-spot of the cherry has been severe in locations. In places where this disease has affected trees for two years in succession, there has been serious loss. The English Morello and other cherries of that type have suffered most. This year we have sprayed with Bordeaux mixture for it, and I believe with a good measure of success.

Blight has never been known to be so widespread and severe. Apple trees were blighted to death, while the Russian pears were snuffed out in short order. Even the Kieffer blighted badly in some instances. On our own grounds, the Garber alone escaped, but why it did so, will probably remain a mystery. The codling moth seemed to be in greater abundance than usual. Perhaps this seeming abundance was due to the comparative small crop of fruit. The same may be said of the Aphides, plum trees in particular being generally affected. The curculio, for once, was practically out of business.

There has been great progress in tree and small fruit planting. I know of many orchards of apples, plums and cherries being set out. Even pears and especially peaches are receiving some attention. This work is being done mostly by young men, and every one of them ought to belong to the Iowa State Horticultural Society.

Already there is much planning for next year. I believe 1904 will witness a steady and healthy advance along the horticultural lines.

Fruit trees and vines of all kinds have apparently gone into winter quarters in good condition. I have never seen the cherry trees more thickly set with fruit buds. I now see but one cloud which is dimly casting a shadow over these bright and rosy prospects. The long dry autumn, with almost constant high winds, and with no snow to cover Mother earth, I cannot help but regard as a serious menance to all vegetables.

REPORT OF DIRECTOR OF THE FIFTH DISTRICT.

BY W. O. WILLARD, GRINNELL.

Conditions during the past winter were favorable in that we had no extreme low temperature, and the wood and fruit buds of our more tender varieties came through in good condition.

Until the May freeze the prospect never seemed better for an abundant crop of all kinds of fruit, and later the bloom which seemed to have escaped uninjured promised a fair crop, but the damage was greater than it seemed at first and was increased by the continued unfavorable weather.

Apples were a very light crop and very poor in quality, the sound apple was the exceptions, the Duchess doing the best among early varieties. Winter sorts were largely Ben Davis, Jonathan and Romanstem.

Cherries were about 25 per cent of a crop on Early Richmond. Later varieties bore little and the fruit was so wormy as to be of little value. In our immediate vicinity all varieties of the plum failed, but in some other locations a good crop of Miner plums was reported.

The Bailey peach seemed to be a little more hardy in fruit bud than other varieties and there was a light crop, but an unusual amount of the fruit cracked and rotted on the tree before it ripened.

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There did not seem to be the usual amount of bloom on the grape, the season was unfavorable and the crop was light and not the best in quality. Worden and Moore's Early were the best among the black; Wyoming and Woodruff Red are promising grapes of that color.

No gooseberries and but light crop of currants and raspberries.

The Snyder blackberry, which is the only profitable variety we have found yet, came through the winter in perfect condition and produced an unusually large crop of fruit.

The strawberry suffered but little from frost, the yield was large and the season very long. The demand was good for all kinds of fruit and prices very satisfactory.

FUNGOUS DISEASES. Cherry trees suffered some from the leaf spot, but not so as to injure the tree or fruit to any great extent. There was not more than the usual amount of twig blight on the apple trees but the fruit was considerably affected by the scab. Currants and gooseberries held their foliage well and the foliage of the grape was much better than the season before. While there are some promising new fruits the standard, well tested varieties, are the most satisfactory.

REPORT OF DIRECTOR OF THE SIXTH DISTRICT.

BY M. J. GRAHAM, ADEL.

The season opened full of promise with fruit buds of even the peach and half hardy cherries uninjured by winter's cold, but when cherries, plums and pears were in full bloom, the prospective crop of these fruits was almost entirely destroyed by the cold wave that swept down the Mississippi valley during the last days of April.

Floods of rain, later, reduced the apple crop by washing off the pollen or inducing scab on the fruit after it had formed.

The percentage of a full crop was about as follows: Strawberries, 75 per cent, with late varieties, such as Brandywine and Senator Dunlap, the best; Black raspberries, 75 per cent; Red raspberries, 75 per cent; Hybrid raspberries, Cardinal and Columbia, 100 per cent; Blackberries, 100 per cent; Gooseberries and currants practically a failure; Grapes, Moore's Early, light, Concord, 50 per cent; Plums a failure, except in isolated cases where the trees were protected by shelter belts of timber. Burbank and Poole's Pride produced a full crop. Peaches a fair crop, largely of Bokara No. 3, Champion and natural seedlings of the Bailey and Mitchell; Cherries varied from 0 to 30 per cent; Early apples, 75 per cent, with Duchess, Lowell and Cole's Quince in the lead; fall apples, 30 per cent; winter apples a failure except in a few well sheltered situations.

With the exception of cherries fruit trees appear to be in good condition and promise a full crop next year. This is especially true as to peaches and pears.

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REPORT OF DIRECTOR OF THE SEVENTH DISTRICT.

BY B. SHONTZ, CORRECTIONVILLE.

The fruit crop in the Seventh District, with the exception of cherries and plums, was unusually fine.

The apple crop was especialiy good, and has been a great inspiration to orchardists in this part of the state.

The per cent. of yield of the different fruits were as follows: Apples, 100 per cent; cherries, 5 per cent; plums, 5 per cent; grapes, 40 per cent; strawberries, 100 per cent; raspberries, 70 per cent; blackberries, 80 per cent.

REPORT OF THE DIRECTOR OF THE EIGHTH DISTRICT.

BY C. H. TRUE, EDGWOOD.

Late frost and sleet did great damage to the cherry and plum crop, especially to the early blooming varieties. Among the late plums Miner bore best of any. The yield in these tree fruits throughout the district ranged from nothing to a half crop. The cold spell did not seem to affect the apple buds to any perceptible degree but for some reason the fruit became scabby, and illshaped and nearly all dropped before maturing rendering the crop light and inferior generally. Apple worms were as troublesome as in former years. Spraying has been generally neglected on account of frequent rains and for want of time to do the work, Apple twigblight unusually prevalent and considerable damage experienced. Considerable dropping of cherry foliage from leaf rust or other causes. Little effort made to prevent the same. Strawberries were usually a good crop. Raspberries, gooseberries and currents gave a very light yield, being a total failure in some localities. Blackberries on the contrary bore abundantly, while grapes on young healthy vines gave a fair yield but ripened very slowly and unevenly on account of the cool wet summer. Old and neglected vines bore little or nothing.

Prices for all kinds of fruit were quite satisfactory. New varieties are being planted cautiously, the standard and reliable sort predominating. The season was very favorable for a rapid and apparently healthy growth of all fruit tree and fruiting plants, including also young nursery stock. The present prospect indicates abundant fruit crops for the year to come, barring unforseen dangers.

REPORT OF DIRECTOR OF THE NINTH DISTRICT.

BY G. A. IVINS, IOWA FALLS.

The past season throughout the Ninth District has not been altogether favorable for growing fruit. The strawberry crop in some localities was from a fair crop to a full one, and prices for home grown berries sold by the case at ten and twelve and one-half cents per quart. The varieties that gave the greatest yield were Crescent, Clyde and Fountain, Other varieties that us-

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ually bear heavy crops were caught by heavy rains when in full bloom, and their yield was only fair, but all varieties vary more or less in different localities. Raspberries both black and red were not more than 40 per cent of a full crop, and sold readily at twelve and one-half to fifteen cents per quart. The Columbia gave the greatest yield of any one variety, but it is not quite as hardy as we wish it was. Currants and gooseberries were a very light crop; the early freeze being the cause of it. There are but few blackberries grown in my district but what there are they bore a heavy crop. The cherry crop was almost a failure. Early Richmond bore some, but the fruit was small and inferior. Grapes set an average crop, but the foliage was diseased and but few varieties ripened their fruit in good condition, and the quality was only fair, The plum harvest was generally light. The varieties that bore what fruit we had, were Stoddard, Wyant, Miner, and Hawkeye. The Stoddard yielded the largest crop of all, and the Miner was next in yield. The fruit was very large, fine in quality, and but few were punctured by curculio or gouger. The crop readily sold for $1.50 per bushel, and the people were not half supplied. The apple bloom was large and a good average crop set on most varieties. The early varieties bore a good crop of large smooth, perfect apples. Gipsy Girl and a few other varieties bore a fair crop of fine apples. Wealthy bore a good crop, but fully one-half were scabby and imperfect. Longfield matured a heavy crop, and nearly all were smooth and perfect. The winter varieties were all more scabby and imperfect than the fall apples.

REPORT OF THE DIRECTOR OF THE TENTH DISTRICT.

BY P. F. KINNE, STORM LAKE.

The late frost affected the entire district and spoiled the prospect of the big crop of cherries that the trees gave promise of. The Bessarabian and Osthimer varieties bore an extraordinary crop of buds; only light crops of Richmond and Morreillo cherries were raised so far as I was able to learn. Strawberries were an unusually good crop, except on low ground, where they were nearly a failure. Much rust was apparent, nearly all varieties being more or less affected, but Warfield, Excelsior, Sample, Dunlap and August Luther were exceptionally bad. Cumberland seemed to be easily in the lead for a blackcap, but Palmer and Older gave good results. Spraying was simply out of the question by the wet process as there was not time between the showers to get out the apparatus, but was done most liberally by the weatherman. In such large measure was the water given out to us that the plum crop was almost a total failure, with very few exceptions, over the entire district, the only exceptions being Abundance and Burbank plums, which in some instances gave heavy crops. The native plums only had about two hours of sunshine during the entire blooming period. Raspberries and blackberries were in their element, none too much rain for the crop, the only difficulty was to get it secured between the showers.

Early apples were a good crop of fine fruit, realizing good prices, going mainly on the market for $1.50 per barrel, barrels and packing furnished by the buyer. This was a Russian apple year all over the entire state, Yellow Transparant and Antovooka were especially fine. Our Kansas buyer

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marking Antonooka barrels, Iowa Bellflower and Hibernal went into the barrels as Greening along with Patten's Greening, which bore a heavy crop of fine looking apples. Wealthy varied more than any other apple, some orchards carrying a very fine crop of fruit, while others scabbed so badly as to make a very poor cider apple. Scab was very prevalent, especially on Genet, Iowa Blush, Harry Kaump, Walbridge, Utter, Haas, McMahon and nearly all sweet varieties.

REPORT OF DIRECTOR OF THE TWELFTH DISTRICT.

BY EUGENE SECOR, FOREST CITY.

Horticulturally considered the Twelfth District lies just outside the Garden of Eden. In that delectable spot we are told that the Lord made to grow "every tree that is pleasant to the sight, and good for food."

We have a goodly list of ornamentals—trees "pleasant to the sight"—and we can no doubt raise better apples than Adam ever did, and yet we have our limitations. There are perhaps a hundred species and varieties of forest and ornamental trees that can be grown in our part of the State but we can't raise *every* tree that is "pleasant to the sight."

We are glad to know, however, that a good many desirable ornamentals can be raised clear to the North line of this State. I will mention a partial list of trees and shrubs not native to the district—a few exceptions—that have been found to be (not all of them perfectly) adapted to our climate.

These, besides a goodly list of natives, will demonstrate the fact that we are not entirely without the means of enjoyment in a horticultural sense.

Buckeye and horse chestnuts, catalpa (two species), cut leaf birch, and all the other white birches, Kentucky coffee tree, honey locust, sugar and soft maple, all the poplars, golden willow, laurel leaf willow and a number of other varieties; pines, spruces, firs and cedars; pea tree, wild olive, buffalo berry, cut leaf mulberry, mountain ash, tamarix, xanthocerus and ginko; lilacs, mock oranges, tree honey-suckles, spireas and snowballs all in variety; hydrangea, golden elder, ornamental sumac, cranberry tree, flowering currant, roses and hardy herbaceous perennials. Some of these are benefited by winter protection. Many other choice ornamentals will no doubt do well in this district. It needs missionary work to get the farmers to take any interest in plants to beautify the home grounds. The home is entitled to something better than the usual cottonwood, box-elder and willow.

FRUITS. There has been no thorough work done with the sprayer so far as I know. Some spraying outfits have been purchased and a few spasmodic efforts have been made in that direction, but for some reason they have not been followed up persistently enough or systematically enough to prove the value of the practice.

The past season, during the blooming season and for some time before and after, the weather was so unpropitious it was little use to try to spray. The chemicals or preparations would be washed off too soon after applying.

I don't know that dust-spraying has ever been tried in this district. For a wet season this might be more successful than the other.

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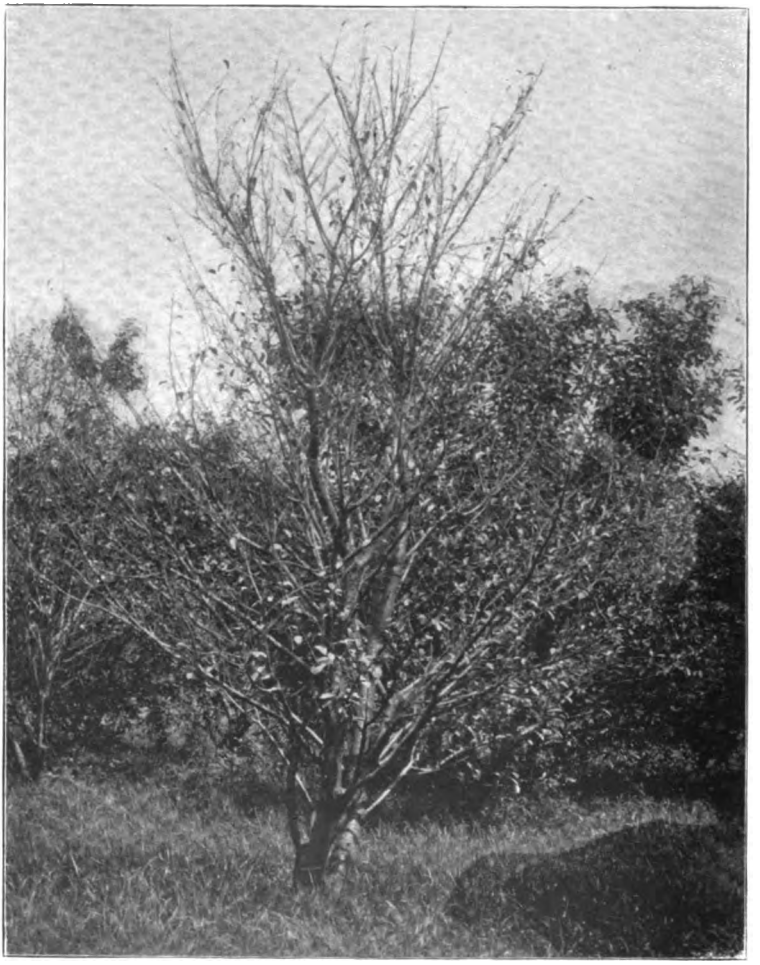

Tree badly defoliated by cherry spot (*Cylindrosporium Padi*) a common fungus disease of the cherry and plum widely distributed in Iowa For treatment see bulletin No. 18, Iowa Agricultural experiment station and spray calendar issued by the same station.

Photograph by Charlotte M. King.

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It looks as if something will have to be done to combat the increasing pests of the orchard. What with codling moths galore, aphides ad infinitum, and the whole tribe of scales that scale the orchard fences while the keeper is asleep, it begins to look as though there is no danger of the fruit-grower's getting puffed up with the idea that he is the whole thing.

He will have to raise more hogs to eat the wormy and worthless fruit or else get a move on himself and go gunning for the good-for-nothing game.

Notwithstanding these draw-backs, pretty good crops were obtained this year on the young orchards. Oldenburg, Wealthy and Patten were well loaded. Some fine Northwestern Greenings were shown.

The great need of the apple grower in the North is better keepers or cold storage. There is no trouble to raise all the summer and fall apples we need, but how to be sure of a supply from January to April is the burning question.

Small fruits were only a partial crop. Strawberries were beautifully large but the yield was only medium.

THE PRESIDENT: We will now give a few moments to a discussion of these reports.

A MEMBER: I would like to ask the gentlemen who have reported as to the condition of cherry trees, the loss of foliage, what they think of those trees as to their promise of a crop of fruit this year.

MR. BRANSON: The Early Richmond and the Morello are all right. The Montmorency are practically dead; no doubt there will be hundreds of them that are practically worthless; they may be in a condition that they will grow in another year.

A MEMBER: They have set fruit buds for another year?

MR. BRANSON. Yes, they have; some of those that were damaged have made some growth and there are some fruit buds there.

A MEMBER: That is a serious question. Now, I have a very few English Morello trees on the place; but if any one orders English Morello trees I would be very careful where they come from.

MR. BRANSON: I think that we have got to come to the plan of spraying cherry trees from the time they are young. I think that wherever you find in Iowa cherry trees that have been sprayed from the time they were a year old to four years old, that they will be all right; but whether we can recommend the Morello unless it has been sprayed—I know that Silas Wilson a few years ago recommended them as one of the best market cherry. I know I planted a hundred, on Mazzard stocks.

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There is one question in regard to the dryness of the ground. We need to have no fears along that line at all. In the last two weeks we had 140 rods of fence to build; there is only just two or three inches of ground that is dry; it is just as moist all over my farm as it has been for years. Last week I put down a well with fifteen inch tile. The day following its completion I measured it and it had twenty feet of water in it. Day before yesterday I went to measure it and it was within eight feet of the top, on that high land around New Sharon.

Mr. FORSTER: Being interested in the southeastern portion of Iowa, there has been an inquiry in my mind ever since last December, and since I came to this meeting, it has occurred to me, that we had some damp days in December, followed by sleet which froze and hung on for several days. While I predicted then that our fruit crops were hurt seriously, I find that it is being laid to the April and May frosts. Now, it is a question in my mind whether we can apply it to April and May, or to December, in our portion of the country.

We had localities, on high ground, where we had a full crop of grapes; now, if that early frost affected other fruits, why did it not affect these? These are questions I would like to have answered.

Again, we find varieties more seriously affected that didn't mature until fall; we noticed that in the peaches. we could tell it by the foliage.

I leave these remarks and questions for other and more experienced horticulturists to consider. In regard to the strawberry bloom, those that were in bloom at the time, the freeze killed; those that came out later were not affected. I noticed that some varieties were killed before they opened, but types like the Crescent and that variety were not; it was the bloom that was open which was destroyed as a general thing.

THE PRESIDENT: We have with us the delegate from the Illinois Horticultural Society. We are glad, Mr. Brown, that you are with us.

MR. BROWN: I do not at all feel like a stranger among you. I live opposite the state of Iowa. I can look across the Mississippi and see the states of Iowa and Missouri and my own state. I come here without any particular credentials, except that I am a substitute. I know I am welcome and appreciate it.

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MR. BURNAP: I move you, Mr. President, that Mr. Brown and the Rev. Mr. Guild, and the gentlemen from Wisconsin and Minnesota be made honorary members of this Society.

By a unanimous vote the motion prevailed.

MR. TRIGG: Mr. Graham in his report speaks about a sheltered location.

MR. GRAHAM: Yes, sir.

MR. TRIGG: What is it?

MR. GRAHAM: I mean a heavy body of timber or growth to the northwest. I know, in the past, that has been considered of value, and I think in a cold spring like we had this year, it was very valuable.

A MEMBER: I had in my orchard one plum tree that stood out to the northwest where the wind hit it squarely; it ripened a large crop of plums. It was in full bloom at that time, and without any protection whatever.

MR. GRAHAM: I cannot account for that.

THE PRESIDENT: We will hear the report of director of the Eleventh District, Mr. Trigg.

MR. TRIGG: Northern Iowa, for reasons of altitude and climate is conceded to be the least promising section in the State for growing fruit. The fact is, we up there do not expect very much and so we are not disappointed to anywhere near the degree you are in the southern part of the State. There are some things we have found out we can not raise. We do not monkey with the peach, nor any variety of the plums, save the American types. We know we can raise a few varieties of apples; we can raise excellent strawberries, raspberries, currants and gooseberries, but only once in about fourteen years can we raise any blackberries. I think there is no plant I have tried to give as much attention as I have blackberries, and for eight years I have irrigated it, mulched and pruned it and never got a berry. Last spring I got exasperated and took them out. A few sprouts came up this, 1903 of our Lord, that were literally covered with fruit.

Summing up the year's work in northern Iowa, and it may be done in a few words in this way: We had a good crop of summer and fall apples. The Wealthy was scabbed badly, but the Patten's Greening was almost exempt from scab, growing in alternate rows in my orchard; the Greening being large and handsome, saleable fruit, and the Wealthy not worth picking off the tree.

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The surprise of the year has been the remarkable revelations made by the Northwestern Greening in our section of the state. We commenced to plant it about ten years ago. While it has grown vigorously, it has never born any fruit and people had come to look upon it with suspicion and regard it not worth planting. I recollect at our meeting last year, it was a matter that was brought up by a gentleman from Wisconsin. He said the Northwestern Greening had to be planted under certain conditions. But this year, In Northern Iowa, wherever the Northwestern Greening was, whether on high or lowland, sheltered or not, it produced a magnificent crop.

You need not go any further than the north table out here in our exhibit and see it there to convince yourselves. The trees I had planted ten or twelve years ago were carrying all the apples any tree ought to carry. I do not believe that there was an under size apple on the tree. They were sufficiently good to sell in our town at 80 cents a bushel.

I think there is a good deal of interest in orcharding and fruit growing in our section of the state; we regard the things that we can grow as safe to grow. The Wealthy apple, Patten's Greening, the Northwestern Greening, and perhaps a half dozen varieties of apples can be set out there with reasonable safety.

The trouble we have found is to get trees true to name. I do not blame the nursery men, because they can not watch every tree that goes out of the nursery from the time it is sold. It is true, though, that too many trees are sent out under false names.

We are not worrying about the winter any; we would like to see about a foot of snow covering the ground; plenty of moisture in the ground; everybody in our section seems chipper; we are not worrying about peach buds, or cherry buds, or anything of the kind.

A MEMBER: You are just worrying about the blackberries?

MR. TRIGG: I wouldn't have one on the place. I think in the district I represent there is a settled belief that we can grow fruit and men are going at it in a practical way.

A MEMBER: Did you try covering your blackberries with earth?

MR. TRIGG: I covered them; took a blanket and put on them; irrigated them; read the catechism to them and treated them right.

MR. PARSONS: From what has been said, the impression might get out among planters that the Northwestern Greening

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was perfect at all places and under all conditions. Now, in my location, whilst my trees were loaded, yet it was very hard to find a perfect specimen of the Northwestern Greening in Kossuth county; they were badly scabbed.

There is another apple I want to speak of, and that is the McIntosh, but with me it has scabbed every year regardless of the season; this year especially it was so scabbed, it was almost impossible to find a perfect one.

MR. HARRINGTON: It is hardly fair to say the Northwestern Greening is worthless because it is scabbed; that is something all fruits are subject to. For instance, the Willow Twig is more liable to be subject to it. I wouldn't say anything against the Northwestern Greening; the remedy is sulphate of copper and Bordeaux mixture; that will effectually remove it.

MR. BURNAP: There is a word or two I want to say in regard to the director's report from my district. There is one thing Mr. Trigg mentioned I really would like to have you notice. He stated that Patten's Greening was almost perfect. Now, so far as the Northwestern Greening is concerned, I want to endorse everything he said about it, but in regard to the Northwestern Greening, I want to show you a specimen that comes from that district. (Here Mr. Burnap exhibits an apple.) It is scabbed badly, as you see, and I do not want you gentlemen to think that the Northwestern Greening is altogether perfect in our district.

There is one thing more I would like to say, and that is in regard to getting trees in the nursery and not getting them true to name. I do not think that is a fact, because I have dealt with nurserymen all these years and I have yet to get a tree from an Iowa nurseryman but was true to name. My observation is, that any man who goes to the nurserymen in Iowa, gets his order filled true to name.

CAPTAIN WATROUS: I have been a nurseryman and have dealt with nurserymen for over thirty years; I have dealt with men in a good many other lines of business and it is my deliberate judgment, standing here, that there is no other line of work that I know of where so much is trusted to the good faith and honesty of the seller as in the nursery business. To the average man one tree looks like another tree, and he must trust entirely to the good faith and the skill of the nurseryman who grows these trees. I do not believe there is another line of business where that confidence is held more sacred or is abused less often. Every nurseryman sends to the end of the land to another nurseryman to

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get stock; he expects, without doubt, that it is going to be true to name; if he does not get it, he feels himself greatly injured, and I never knew of a case where that kind of a mistake was not corrected with an humble apology.

MR BURNAP: Now, these specimens of the Northwestern Greening that I have shown you, represent a condition that is universal, and the question is important to us, as to just what caused that condition. I brought them down and passed them among the men of the association and also the professors. If that condition is going to continue, we might as well chop our orchards down. There is a difference of opinion among the professors at Ames as to the actual cause of this condition, and I am going to have a critical examination of these specimens and promise to report at the next meeting of our district.

CAPTAIN WATROUS: I want a few seconds more to finish my speech, that is this; let every man who is approached by any stranger to sell him nursery stock, satisfy himself before he buys any of that man that he carries a properly signed certificate from a known, responsible nurseryman; the nearer home, the better, and I think his chance of being swindled is reduced to a minimum. If he buys trees of a stranger with a fine team, plug hat and kid gloves, who says that he represents a nursery at Des Moines, or Dayton, Ohio, or any other place, and does not have a duly authenticated certificate of a known nursery, let it be understood that he is dealing with that man at his own risk; if you buy of him, and things do not come out right, it is your own fault. If you buy of a man who has a proper certificate, especially a home nursery, then it is the nurseryman's fault.

MR. TRIGG: I want to make an explanation. I think I said plainly that I did not blame the nurserymen for it, but you are made the victim of a lot of traveling rascals over this state.

THE PRESIDENT: The next paper on the program is entitled, "Conditions," by W. A. Burnap, of Clear Lake.

CONDITIONS.

BY W. A. BURNAP, CLEAR LAKE.

I read this paper with fear and trembling. I realize fully and perfectly that I may herein get myself into trouble, and I anxiously apprehend that when I fearfully take my seat some of you may quickly and willingly arise and earnestly and joyfully proceed to place my horticultural scalp upon

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your table. Notwithstanding all this I believe this paper should be written and I reluctantly volunteer my services, "For the good of the cause."

The average citizen who desires to make a venture in the horticultural field will, if he is intelligent, study our reports, and selecting some one of our members who is authority upon and has had experience in the line upon which he wishes to make his entry, will carefully read what that person has written; will follow as nearly as possible in his footsteps and will doubtless, to a greater or less extent fail. It is for this man, and others who are contemplating planting, that this paper was written. The new beginner did well to study our report before planting, he did well to consult the experience of any of our veteran members and he did well to follow, to a certain extent, in their footsteps, but, my dear beginner, there is no such royal road to horticultural success as you have here contemplated; if there were every man, boy or girl who could read a report would be an experienced and expert horticulturist; you have met some, but you have failed to comply with all the conditions of success; you have failed here in the one great point of not appreciating the different conditions existing between and governing the two plantings of the man you copied and your own. Conditions of soil, conditions of location, conditions of climate, conditions of surroundings, and last though perhaps least, conditions of the man who directed the two plantations. All horticultural success depends largely upon Conditions, Conditions, Conditions, and he only who earnestly follows their leadings or carefully guards against their dangers, will find a credit balance in his yearly loss and gain account. These conditions must, many of them, be studied by every grower in his own location and upon his own plantation and he who studies them the most carefully and observes them the most minutely most nearly places himself in the condition for success We ourselves, as a society are too apt to say nothing of these things when we should print them in the largest kind of type and shout them from the house-top. That this indictment against us rings true every report of every one of our societies most abundantly proves; examine them, and you will see where one member recommends a certain strawberry, while another condemns it. Why? different conditions. This member succeeds with a certain grape, and that one fails. Why? different conditions. Certain ones have bountiful crops and fine trees of a certain variety of apple, while with others it fails to bear or the tree has been consigned to the woodpile. Why? Different conditions, and yet little or nothing is brought out of what these conditions are and the causes of their success or failure.

Conditions favorable for and adverse to horticultural success meet us at every expected and unexpected turn, and no change of latitude or longitude or altitude is necessary or even useful to develop them. Eighty rods from my home is an orchard wherein conditions are such that Wealthy of twenty years standing seems perfectly hardy, while on my ground only one-fourth of a mile away conditions have made them absolutely tender. On the east side of Clear Lake, near the town, are five strawberry growers and all unite in condemning Beder Wood because it does nothing for them, while in my new grounds, across the lake, a little more than two miles away, it is my main dependence and does better even than Warfield.

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Conditions of and for cultivation vary everywhere according to circumstances. A few years ago as your delegate I attended the meeting of the Minnesota State Horticultural Society, and while there the question of cultivation of orchards was brought up and vigorously discussed. Quite a number, with the president of the society to lead, urged clean cultivation, while others insisted on absolute necessity of some cover crop, at least in the north.

Whatever may prove to be good conditions of culture in the south, the next hard winter settled the conditions for the north by wiping out many orchards down as far as the central line of the state, that were not covered in some manner. Now right here I expect the apple growers of the society to reach for my scalp. I believe there are many worse things in an orchard than blue grass—it certainly saved great numbers of orchards in northern Iowa and Minnesota that root killing winter and my observation has shown that it is not always fatal to fine fruit.

During the discussion on orchard culture just mentioned, President Underwood, who was an enthusiast on clean culture, thinking to prove his position, said. "I think I can settle this matter, the man who exhibited the beautiful apples at our last State fair, and took most of the premiums is present, and I will guarantee that he raised those apples under clean cultivation. Then turning to the gentleman in question he said: Mr. ——— will you please tell us how you cultivate your orchard. The gentleman rose with a peculiar smile on his face and stated. My orchard is in blue grass sod, grown tight up to the trees and has been for years. Somehow from this point debate languished on the part of the clean cultivation. I visited the Champaign Illinois Agricultural College at one time and talking with the assistant professor of horticulture found that their experimental orchard had been in blue grass for years. Talking with Appletree Barnes, of Wisconsin, the promoter of the Northwestern Greening, regarding the productions of that variety of apple, he said—"To procure results from it you must stop its growth as soon as possible." In other words I replied, "Let the orchard grow up in blue grass." He looked around as if to see that no one was listening who would indict him for high treason and answered, "Well yes."

I suppose by this time you have all made up your minds that I am a strenuous advocate of blue grass in the orchard. If you have come to such conclusions, I want to say you never were more mistaken in your life. I only would permit it under certain conditions, and under other conditions I would not.

Right in point I believe conditions in my own orchard are such that I want the blue grass out, and if any member will tell me how to get rid of it he will place me under lasting obligations. Conditions often make rapid and violent changes if we closely observe facts. I thought at one time that I knew about all that was worth knowing regarding conditions for orchard soils in northern Iowa. For years I was president of the Farmers' Institute of our county, and when consulted by members about orchard planting always advised them to plant freely, with assurance of success, provided their soil conditions were favorable, that is if they had high dry land with a clay subsoil, but never, *never*, NEVER to set upon a sand or gravel subsoil, as the conditions of such a location were such that they were then absolutely bound

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to fail. Later talking with the most successful orchardist of our county I asked him what his subsoil was and he dazed me by replying, sand and gravel. When I had recovered my breath I said, Dan you must be mistaken, but he closed the subject by saying, Burnap, I am an Irishman and I guess I know sand and gravel when I see it, and I guess Dan did, but my self confidence in my knowledge of right soil conditions suffered a fearful blight. Afterwards I visited our horticultural friends in South Dakota and found some of them growing fine orchards on the Missouri bottoms above sand and gravel subsoil, and the idea dawned upon me that there might be many things in heaven and earth regarding soil culture that I had never thought about. I commenced investigating and found that in both of these cases the water line was only some ten or twelve feet below the surface and the sand and gravel in place of drawing the moisture away from the trees, as it usually does, brought it to them by capillary attraction. Thus the riddle of that soil condition was solved.

Frequently upon our grounds and in our work we run up against conditions with such a bang as to make one dizzy for a month. I suffered such an experience on my strawberry bed last year. After picking my first crop I plowed down to a narrow strip and worked most of it as a new bed; now that is correct culture, you growers recommend it, and it has brought me out all right in past years. But, now I expect to get into trouble with our strawberry men. If I had gone fishing as soon as I quit picking, and never looked at the bed again until this spring, it would have been more than a thousand dollars in my pocket, and I can prove it.

Whether conditions were such last fall that I could not work my whole ten acres as I wished, some of it was only partly worked and some was not touched at all. Now please note the conditions that ruined my sleep and spoiled my temper all summer long.

The crop this year was exactly in inverse ratio to the amount of work performed. Where I fully cultivated and worked as I wanted it done, there I had few berries. Where the bed was partially worked, there a fair crop, and where it was not touched at all, there I had a full crop of nice fruit and a constant quarrel amongst the pickers for assignment to that part of the patch.

Please do not gather from this that I relax in the least from my opinion as to the desirability of clean culture for strawberries. I do not. I defy any one to gather a cap full of weeds to the acre on my new beds and I could not enjoy this meeting did I not know that my vines were carefully tucked away for their winter sleep under their cover of marsh hay. I tell this to show what I lost by not noting the conditions of my bed before working it.

Now as conditions here seem to point to the fact that this audience is weary I will draw this subject, which might be continued for hours without being exhausted, to a close, by most emphatically saying, that nothing in this paper is intended to discourage any one who has a love for horticultural work from entering the field with us. On the contrary I would most earnestly urge them to do so and can promise from us a most cordial welcome should they join our ranks and to them health, satisfaction, pleasure and money if they will faithfully, carefully, intelligently and constantly study, in their own locality and about their own grounds, all necessary and reasonable *conditions*.

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CAPTAIN WATROUS: I want to tell you how to kill blue grass. I would wait until about the 1st of July and put in a team with a breaking plow and gauge wheel and turn over all that is in the orchard, going as near the trees as possible, and the remainder I would cover with manure from livery barns; cover it deeply and it will kill the blue grass.

MR. BURNAP: Has anybody tried the Clark cultivator?

MR. IVINS: I have; but you have to plow it first with a plow and then put the Clark reversible cultivator in there and it will do it. It is one of the finest tools I have got on my place. You want to get a twelve-inch disc and you get the finest tool a man can have.

MR. BURNAP: The only objection to that is that I am going to leave my orchard uncovered.

CAPTAIN WATROUS: If you will let it alone there will be plenty of weeds growing; and then this manure will probably be plenty of protection.

THE PRESIDENT: The next paper is entitled, "Dewberries" by W. S. Fultz, of Muscatine.

THE LUCRETIA DEWBERRY.

BY W. S. FULTZ, MUSCATINE.

To successfully grow the Lucretia Dewberry in Iowa requires great care and peculiar treatment. Being rather tender it requires to be protected during the winter and when properly managed and given winter protection it is a profitable berry to grow.

The first four or five years that we tried to grow it we made a failure, notwithstanding the fact that we tried various methods of treatment. Three years ago this fall we hit upon a method of treatment that we have since followed with decided success.

We plant in rows seven feet apart, and set the plants five feet apart in the rows. The first year we planted potatoes with the dewberries as a nurse crop and in the fall after the potatoes were dug the dewberries were covered with a mulch to protect them during the winter. The following spring the vines were raised above the mulch and clean culture given during the summer. The following fall after the leaves had fallen the vines were all cut away from each hill except six, three on each side. These six vines were cut back to three and one-half to four feet long and were then drawn down lengthwise of the row, three each way from the hill and fastened down with a couple of small stakes. This drawing down of the vines is done to bring down or straighten the bow that grows in each vine at the hill so as to reduce the amount of mulch needed for covering and to give better protection by having the vine close to the ground. This small slender row of vines is then

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covered over with earth or with mulch of some kind. We have covered with earth by throwing it over the vines with a plow which is the most rapid way of doing the work. We have also tried various kinds of mulch and now cover entirely with forest leaves which are held in place with a little earth thrown on the edges of the row of leaves by a small seven-inch plow. The leaves should be about three inches deep over the vines and just wide enough to properly cover them. When trimmed and drawn down close to the ground it requires but a small amount of leaves to properly cover the vines. Care should be taken that there is no frost in the vines when staking down, as then they are very brittle and apt to break.

The second spring after planting, good strong posts are set at each end of the rows the posts to extend two feet above the ground, and well braced. Stakes are driven in the ground every fifteen feet along the row, the stakes to be as high above the ground as the posts. A No. 12 wire is then strung over the rows and fastened to the posts and stakes. The wire should be at least twenty inches above the ground. In the spring the little stakes that hold the vines to the ground are pulled up and the vines are raised and tied to the wire. The leaves are allowed to remain on the ground as they save hoeing by keeping down the weeds in the row. A horse and plough or cultivator is used to keep the spaces between the rows clear of weeds.

The object of tying up the vines to a wire is twofold. First, to keep the berries off the ground, and keep them clean, and second, to keep the bearing vines high enough from the ground so that the new growth will not overrun and smother them. We find that it is very detrimental to their bearing qualities to allow the new or current year's growth to overrun the old or bearing vines. The treatment for each succeeding year is the same as for the second year.

It must not be supposed that this treatnent of the dewberry can be given without labor. It requires a large amount of care and labor to raise any kind of fruit and the dewberry is no exception.

THE PRESIDENT: The paper is before you for discussion.

MR. TRIGG: What is the yield?

MR. FULTZ: I will tell you; my boys and I are in partnership; I can give you the financial account, which was $175 a year, from the acre; that was gross returns.

MR. TRIGG: What does it cost to rig it out?

MR. FULTZ: I gave the figure to Professor Erwin.

PROFESSOR ERWIN: About $38 or $40.

MR. TRIGG: How does the price compare with blackberries?

MR. FULTZ: We contracted them for $3.25 a case in Muscatine.

MR. BURNAP: To what extent do you grow them?

MR. FULTZ: We have one acre.

MR. TRIGG: How long do the plants last?

MR. FULTZ: I couldn't tell you; my experience runs back to February, 1899; in that February freeze we didn't have them protected and they were all killed that spring, to the ground;

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we didn't do anything with them until along in June, I took a spade and went down there and dug a hundred or more up. I told the boys that dewberry patch was gone and to get three of the heaviest horses and plow the ground up and plant it in corn. When we came to cut the corn, there was the finest dewberry patch you ever saw, without a hill missing. They are hard to kill. My opinion is, properly taken care of, they will last twenty years.

A MEMBER: Do you have any difficulty about picking them?

MR. FULTZ: No; they are a little thorny, but there isn't any difficulty. We have trouble in getting pickers on account of the button factories. The berries are quite large. We had four berries there, a party held his hand out and the four berries filled a hand full; of course, those were large berries.

MR. TRIGG: Who was the party, a big-fisted old granger?

MR. FULTZ: A boy about eighteen or nineteen years old. They are fully three inches long. I have tried the Austin dewberry for about two years; but from my experience, it is not equal to the Lucretia.

MR. TRIGG: Do the birds take them?

MR. FULTZ: Not to any extent.

SILAS WILSON: Mr. McGeehon has grown dewberries quite extensively; he is a fruit grower. He has grown Lucretia dewberries just like you have; I have seen them piled up that way two inches long. He says the Lucretia dewberry is a success beyond question if you give it the right kind of treatment and plant it in clay soil, high ground, where it does not have too much gravel.

I might mention, a year or two ago I was down in central Missouri and stopped to visit a fruit firm there and found they were out gathering dewberries. I made some inquiry, and found they shipped a carload the day before and were hustling to make it another carload. They said it was the most profitable small fruit they were growing on the farm. They had no use for any other variety. They drove me out into the field, and I found they were on high land, thin soil with rock coming near the surface.

MR. LINTON: I have grown the Lucretia dewberry almost since it was first introduced. In 1885, I had three acres. Like Mr. Fultz, after I got to understand it a little better, I realized better results. I found that the Lucretia dewberry would go deeper into the earth than any other, and that a great mistake

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A patch of Lucretia Dewberries at Muscatine, Iowa; four berries fill the hand. See page 76.
Photograph from W. S. Fultz.

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is made in planting them on loam ground. On clay-gravel soil you get the best results.

When I located in Missouri—I lived there some time—in planting out a field in small fruit, there was an old roadway that went through the field, and the road bed was plain to be seen, clear through the field, fully fifty feet wide; the top soil had all been taken off. We came up to that planting with raspberries. The boys made the suggestion that we skip that road bed. No, says I, we will plant that with Lucretia dewberry. The second year it was wonderful in shoots, and the third year it was still more wonderful. I would cut them back to two feet or thirty inches.

I never had any trouble on clay soil, and they will outsell any blackberry you can put on the market, and produce double the amount of fruit. I never could get good results where I allowed the vines to take root at the end.

The dewberry is different from other fruit, in as much as the same stock will produce fruit two and three and four years. That is one reason it is not properly understood. The old stock is often taken off, expecting the new stock of fruit, and it is a failure.

The clustering needs to be curtailed. Six good stocks are sufficient in a hill. If you will allow them to run, they will grow fifty or one hundred feet. So far as the life of the dewberry is concerned, I do not know as to that. I find that top dressing with manure will assist it.

PROFESSOR ERWIN: Mr. Stone, at Sioux City, is quite a successful dewberry grower.

THE PRESIDENT: I would like to bring a subject which is exceedingly important to this society, and as Mr. Reeves is not here to read his paper, I will call upon Mr. Silas Wilson on the subject of "Scab." This is a subject we are all interested in.

MR. WILSON: Scab is a subject I have given but very little attention until this year. This year gave me an excellent opportunity for observing in the different localities of more than forty counties in the state, comprising almost all kind of conditions of soil. After this observation, I am entirely at a loss; I am more skeptical than ever in regard to apple scab. Now, then, in some orchards I would see ten or twelve varieties well known in the state. Of these, I would find two or three varieties which were fairly good, and the other varieties would be all scabbed. I would go away from there, probably a mile

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and a half or two miles, and I would find right the opposite varieties loaded with fairly good fruit; it was a combination, misleading in the extreme. For instance, the Snow apple is more subject to scab than any other apple that came under my observation; that I found universally scabbed. The Roman Stem was another one badly scabbed. The Willow Twig, as you all know, is very much subject to scab; I have got some fine specimens of the Willow Twig; and then there would be a row of Snow apples growing close to it, in which there was not a fine specimen to be found. This condition was not confined to young or old trees, or to any particular locality or soil. You could find little spots here and there where the apples seemed to be exempt this year.

I presume that Professor Erwin and these other scientific gentlemen would have a better idea of the cause of these things. I am simply stating to you the condition, which was a surprise, a revelation to me. I made up my mind that the young trees would be the only trees I would be able to find specimens from. I followed it up and found in a general way, that was true; but there were exceptions to that. The very fine specimens from the Willow Twig I had were grown upon old trees. Rawle's Jannet was universally scabbed. The apples I have of those trees were from old trees, universally, not very young trees.

Now, I found all kinds of conditions; a man hardly knows where he is at when he goes out and finds these conditions. I presume these conditions were brought about more on account of the excessive moisture, and the cold, unfavorable season we had. You all know we had very little sunshine last summer; nothing like the average, as we have in Iowa generally. Everything was kept back late; we had very little seasonable weather. That, of course, contributed to the apple scab.

Now, the Wealthy apple is not an apple that is subject to scab, and in many places I found fine specimens entirely exempt from scab, and a mile away from there, there was not a specimen I would have.

MR. BURNAP: To what extent do you think the frost and cold weather in the spring affected this condition?

MR. WILSON: Well, I think in the south part of the State it was very much more noticeable than in the north part. Take Mills county, for instance, and adjoining counties; they had considerable apples, but they were very inferior and very much scabbed; but I think this scab was increased there very much

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on account of the late freeze. There were very few apples, merchantable apples, in Mills county. I think the late freeze contributed its share; even in northern Iowa, I found the same condition.

PROFESSOR ERWIN: I think the keynote to this matter is suggested in Mr. Burnap's paper. We have grown this scab in the laboratory for some time. If you are giving it artificial culture and supply moist conditions, you will find the disease growing rapidly. If you give it dry atmosphere, it does not grow to any extent. That same condition holds true with the orchard, as to sunshine and moisture. A lack of sunshine and excessive moisture are a disadvantage to the fruit, and at the same time furnish an ideal condition for the growth of this disease. On the other hand, spraying was difficult, or in some cases almost impossible.

The question as to the injury by frost last spring comes up. The next day after the freeze, we received a large basket of different twigs from down about Glenwood, on many of them the fruit had just set. If you would examine it closely, it would look as though it was blistered and the inner layer was slightly discolored. I wrote to these people to send me samples, and upon examination they showed that they did not fully develop. I think the past season in many places, on account of the frost and the unusual moisture and lack of sunshine, combined in the development of the scab.

MR. HARRINGTON: I have been spraying my trees for two years, but the apple scab seems to have gained entrance into my orchard and I finally had to adopt something else than simply spraying with insecticide. The stem of the apple would be affected with fungi and would be covered with scab when they were the size of a crab-apple. I began spraying with bordeau mixture and used insecticide with it, and during the first year's spraying with Bordeaux mixture, I had very little interference with scab. But the Willow Twig shows the mark of it yet; the following season the Willow Twig was perfect, so far as the scab was concerned.

Of course, we had some little trouble with the codling moth. Now, where I sprayed with the Bordeaux mixture, I had no trouble on the leaf or fruit or with the apple scab.

This year's conditions were such when I commenced to spray, that we were simply driven out of the orchard; we simply stopped and let it go. This fall my apples all showed scab to a

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greater or less degree; not only the leaf condition was not normal—many trees had shed nearly half the leaves, because of this fungus, and the other leaves remaining showed more or less of it. The functions of the tree were more or less interfered with; the fruit did not attain its size or normal color.

Last year the conditions were much the same as this year. This fall the condition was very favorable for the development and of growth.

MR. PATTEN: I tried to get the floor three or four times when the reports were being read, but did not succeed, and thought we were passing over a very important subject to the fruit growers of this State, and one which may perhaps prove very important.

I have had an experience which confirms the experience of Mr. Harrington, in reference to the treatment of the scab, which pretty conclusively proves the practicability of Bordeaux mixture.

Several years ago my Duchess orchard, about three acres was badly affected with the scab. The first year we had a little good fruit; the next year we had almost no good fruit from that three acres of Duchess of Oldenburg. We then sprayed our trees, with the result that two-thirds perhaps, of the apples were free from scab. The next year we sprayed again, thoroughly, and the result was, we had almost entirely clean fruit.

There is another point that I had thought of, and I wish to utter a word of warning in reference to the optimistic views that have been expressed about the condition of our trees, about their passing through the winter and producing a good crop of fruit. My own opinion is, that those trees that were so much injured by the wet weather last spring, are in a very delicate condition, many of them, and in proportion to the injury of the leaf, because if the leaves of a tree are not perfect, the majority of the wood certainly can not be perfect and many trees in northern Iowa, and many varieties have very scanty foliage; indeed, very imperfect foliage, and if we do not make a tremendous effort in spraying our trees in the spring of the year, and commence before the blossoms are open, and follow it thoroughly, we shall suffer very greatly all over the states of Iowa, Minnesota and Wisconsin.

A farther thought, with reference to the thought expressed by Professor Erwin in explanation of the condition of the orchards,

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that it was conditions. I believe that is true. Now, where we had such excessive rainfall, clouds over the earth all the day long, and over some orchards especially, so that the moisture was retained on the trees and blossoms, no evaporation going on, the blossoms being poisoned by the effect of the warmth of the season, where it was bad to that extent, there we see the effects on the Wealthy; and where perhaps there was two hours of sunshine in another orchard, there the Wealthy came out in pretty good condition.

The whole thing, to my mind, is a matter of condition of the atmosphere at that time. But there is one thing we should take notice of. There are several varieties all over the state that are quite the same under the same conditions. For instance, the Fameuse, Roman Stem, the Walbridge, and several other varieties that have been almost ruined, while there are other varieties which were exempt from that leaf injury. Wherever we had a perfect foliage, we had exceedingly perfect fruit.

PRESIDENT WRAGG: There is some little agitation by the members of this association and by the members of other associations meeting here, over the fact that many members are deprived from attending these meetings of the Park Association, the Farmers' Institute or the Agricultural Society. They say, we all meet at the same time.

It has been suggested by the members of our association and other associations, we ought to get together and have a joint program, and have it, so when the people over the State come here they would know where these meetings were held. Many of you gentlemen would like to have heard Mr. Coburn, and Mr. Hamilton of Washington, but you couldn't go.

There has been a joint resolution placed before the Farmers' Institute urging the different associations to merge their program and divide the time. Now there has been a resolution laid on this table touching the same thing here, I would like to have it referred to a committee and passed upon.

The resolution was read by Mr. Watrous, as follows:

WHEREAS, The meetings of the Agricultural Society, Farmers' Institute, Horticultural Society, Foresters' Association, are all bunched at Des Moines in December and all held at the same time in separate places, and

WHEREAS, The people who come a long distance to attend them and have a common interest in the work of the several organizations are in consequence deprived of the full benefits of such meetings, be it

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Resolved, That the officers of these above-named organizations be requested to next year arrange for a consolidated program, the meetings to be held at some central hall and the time of the sessions to be apportioned among the different societies to the end that all may enjoy the benefits of these meetings.

Its adoption was moved and the motion prevailed.

THE PRESIDENT: We will now hear the reports from the delegates to the State societies and when these reports are all read, we will discuss them.

REPORT OF DELEGATE TO THE MINNESOTA STATE HORTICULTURAL SOCIETY.

BY A. F. COLLMAN, CORNING.

Meeting held in the audience room of the First Unitarian Church. We found the church neatly decorated for the occasion, and your delegate kindly treated.

First day. Meeting was mostly devoted to the culture of small fruits and vegetable gardening, generally good crops and good prices received.

Second day. First was the President's address by Hon. Clarence Wedge, who delivered an excellent address; he spoke in glowing terms of the horticultural interest in the State. The past two winters were mild and seasons favorable for the fruit interest. Secretary and treasurer reported a good healthy condition of the finance and an increase of 180 members the past year. Membership of the society in 1903 was 1,430. They have ten trial stations, with Prof. S. B. Green as the leader, all doing good work. We predict a grand future for the society through the work of their trial stations in the fruit interest.

The afternoon was given to the ladies for an auxiliary joint session under the leadership of Miss Emma White. Several valuable papers were given, full of interest along the line of horticulture and home adornment.

Bee keeping, in connection with horticulture, was given considerable attention. Some of the prominent fruit growers consider the bee necessary to aid the fertilization of fruit.

The first exhibit was very fine for a winter meeting. Their prominent varieties were Northwestern Greening, Patten's Greening, Wealthy, Duchess, Hibernal and Longfield. They also had a fine exhibit of choice seedlings, many of them promising.

Hardy stock for top-grafting was discussed at considerable length, different stocks were mentioned; the Virginia Crab rather taking the lead. General subjects of orcharding were well handled. The fruit men, generally, look for a bright future along the line of commercial orcharding.

The members of the Minnesota State Horticultural Society are certainly wide awake.

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REPORT OF DELEGATE TO THE STATE MEETING OF THE NEBRASKA HORTICULTURAL SOCIETY.

BY J. P. JACKSON, GLENWOOD.

The Nebraska Horticultural Society held its annual meeting at Lincoln January 13th to 15th, inclusive, 1903, in the hall of the State University. The meeting was presided over by L. M. Russell, of Lincoln, a son of the peach king of Nebraska. A very interesting program had been prepared and was carried out. Most of the papers read were written by earnest, progressive young horticulturists, as the reading of their papers gave evidence, men who are in the prime of life and who, taking present indications into consideration, will bring Nebraska to the front along horticultural lines.

Of course there are quite a number of older members who have been the pioneers in blazing the way for the future of horticulture in our sister State, but their good work is almost at an end. Yet with such enthusiasts as Christy, Marshall, Pollard and others, the work will advance notwithstanding the fact that there are many things to discourage horticulturists. The discussion of the various papers were evidence of much interest.

A paper, "Past, Present and Future of Horticulture in Nebraska," by W. G. Swan, of Tecumseh, was discussed in its various phases, also a paper by Prof. R. A. Emerson, entitled, "Horticultural Instruction in the School of Agriculture," was ably presented. But the one most interesting was a preliminary paper on "Diseases of Grapes in Nebraska," which was read by Prof. C. E. Bessey before the horticultural class of the State University. Many other able papers were read and discussed more or less, some seriously, others with much of the spice of life in them, which was somewhat of an inspiration to those who have a tendency to take a pessimistic view of the future of horticulture.

Your delegate in company with the Kansas delegate, Mr. William M. Barnes, of Topeka, had the pleasure of being escorted over the Capitol of Nebraska and through the various State offices by Captain J. H. Culver, of Milford, who, by the way, is one of Nebraska's leading men, having served in the Civil war, led a company of Nebraska Troops through the Philippine war, and is now Adjutant General of Nebraska, and who, last but not least, is a horticultural enthusiast.

In conversing with various members, I find that their society has been and is at present, handicapped in their work by the scanty allowance appropriated by the legislature for horticultural work, but they have hopes of a more liberal allowance from the present legislature, as the president-elect of the society, Mr. G S. Christy, is an influential member of the house, as are also several other members of the society.

The fruit exhibit was exceptionally fine and one that would do credit to any State. The society has several experiment stations in various localities of the State and from reports of the station keepers, it is evident that they are making some advancement.

In closing this paper, I wish to say, that I enjoyed the meeting very much and feel that I was well repaid for the time spent, and hope this society may have the pleasure of entertaining a delegate from the Nebraska Horticultural Society some time in the near future.

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REPORT OF DELEGATE TO ILLINOIS STATE HORTICULTURAL SOCIETY.

BY PROF. H. C. PRICE, COLUMBUS, OHIO.

Although I have left Iowa since the last meeting of this society and once more become a citizen of the Buckeye State, I cannot forget that I am under obligations to you for having the honor of being your delegate to the last meeting of the Illinois State Horticultural Society, and I take pleasure in presenting the following report, although it is with regret that I am unable to be present and once more meet the members of the society.

The Illinois State Horticultural Society met in Champaign on December 18, 19 and 20, 1902. The meetings were held in the auditorium of the College of Agriculture on the campus of the University of Illinois. Ever since the completion of the magnificent building that has been built for agriculture and horticulture by the University, the Horticultural Society has held its annual meetings at the college, and in this there might be a suggestion for Iowa. When the new building is built at Ames for agriculture and horticulture, I believe it would be desirable for the annual meetings of this society to be held at the college occasionally, if not every year. In this way the members are kept familiar with the work being done by the experiment station and college, and such meetings prove of mutual benefit to the society and to the college.

You are all doubtless familiar with the great development that has taken place in Illinois in horticulture the last few years, and the State society plainly shows this development. The meeting was made up principally of commercial fruit growers, men of business, and men who understand how to do business.

The meeting lasted three days and it would be impossible to give anything like a report of all the valuable papers presented at the various sessions, I will simply call attention to a few things in the meeting that seemed to me especially valuable and that might be of interest to you.

The subject of spraying seemed to be paramount and more time, I believe, was devoted to this subjeot than to any other one subject. It was very evident from the discussions that it was generally practiced by the fruit growers and that they regard it as part of the regular work. Considerable experimenting had been done by the different orchardists in the testing of solutions. The opinions seemed to be almost unanimously in favor of arsenate of lead. Where different strengths of paris green had been tested, the standard formula of four ounces of paris green to forty gallons of water gave the best results. Some attention was given to the discussion of dust sprays but very few of the members seemed to be in favor of them. As a member who is no longer in the State, I can speak as an outsider, and it is my opinion that spraying is one of the most important subjects to Iowa horticulturists and Iowa horticulture is farther behind in this regard than in any other one thing. As a concrete example, I might cite that last spring in doing some experimental work in Mills county, I was unable to buy any spraying accessories or to find any dealer who handled any spraying machinery in Glenwood, which is situated in the heart of the apple growing country of Iowa. If my memory serves me right, I believe that in last year's program, the matter of spraying was barely mentioned by this society and I think that Iowa would do well to pattern after Illinois in this regard.

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The subject of co-operation among fruit growers was presented by Mr. J. W. Stanton, vice president of the society. He outlined some methods of marketing through co-operative shipping associations, and among the advantages that he mentioned which could be secured by such organizations were uniform packages, uniform grades, and uniform packing. A great drawback to the successful operation, he said, was the lack of confidence in the shipping associations. Such an association is able to get better service from the railroads and secure better distribution. Mixed cars are shipped to a distributor and the contents consigned to different commission men. The distributor receives the car and distributes the contents as consigned, and in this way car rates are gotten for small consignments.

A delightful paper was presented at one of the evening sessions by Mrs. Freeman of Princeton, Illinois, on the subject of "Wild Flowers for Home Decorations." She said, "I am second to none in admiration of cultivated flowers, but I love the wild flowers. They are the companions of my youth." The paper was filled with beautiful thoughts, and in it she made a suggestion that should appeal to all the prairie states, and that is that parks be reserved for the preservation of native prairie flowers which are so rapidly disappearing.

The social side of the meeting was not neglected, and one night a banquet was given to the members of the society and visiting delegates. After an elaborate luncheon, toasts were responded to from the delegates of the different states and prominent members of the State society.

The Illinois society is energetic in the matter of legislation, and resolutions were passed, instructing their legislative committee on the passage of an act regulating the sale of paris green and other arsenic compounds used by orchardists in spraying.

The meeting, as a whole, was very successful. The attendance was somewhat larger than usual in Iowa, and your delegate was shown every courtesy possible.

REPORT OF THE WISCONSIN DELEGATE FROM THE IOWA STATE HORTICULTURAL SOCIETY.

BY PROF. A. T. ERWIN, AMES.

Your delegate to the Wisconsin State Horticultural meeting, held at Madison, was most cordially received.

The society is located in the State house. Its quarters are more commodious than our present ones, but less accessible, they being located on the fifth floor.

The fruit exhibit was large and of good quality. One feature of it of especial interest was a large collection of cranberries. The cranberry has received little attention at the hands of the plant breeder, and we had always supposed them to be practically one sort. There were exhibited at this meeting a score of varieties, differing in season, color, and acidity. Cranberry growing is a neglected industry in Wisconsin, and at the solicitation of the society the legislature at its last session, appropriated a liberal sum to be expended under the direction of the experiment station, to foster this industry.

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President Loope brought to the meeting three barrels of Wealthy from his home orchard for display. These had been held in cold storage and opened up in fine shape. They were juicy and the color perfect. At recess they were generously sampled by the members, and all pronounced them of good quality.

The Wisconsin growers feel much more encouraged over the Wealthy as a commercial apple since its success in cold storage has been demonstrated.

The society conducts a number of trial stations, somewhat similar in scope to our own, and is giving particular attention to the subject of top-working. A number of reports spoke favorably of the Virginia Crab for this purpose.

The meeting was well attended, and full of interest throughout. One fact of especial interest to me was the number of Wisconsin seedling apples which are finding a place in the standard list. Among those on the tables at this meeting, of Wisconsin origin, were noticed the Pewaukee, Wolf River, Windsor Chief, Northwestern Greening, Milwaukee, Plumbs Cider, Kaump, and the Brier's Sweet Crab. This is, without question, a remarkable list for a State as young as Wisconsin, and these results should be a source of encouragement and inspiration to us. This list represents the survival of the fittest of thousands of seedlings, and "what man has done man may do," let us press on in this good work.

Concluding the reading of his report as delegate to Wisconsin, Professor Erwin said:

I might add, in this same connection, that there was some discussion in the society as to whether these apples would hold up in cold storage. These apples were disposed of the 1st of March; they were in perfect condition; there was less than 14 per cent of decay.

A MEMBER: What about the quality?

PROFESSOR ERWIN: We do not feel safe to hold them any longer than the 1st of March; they seemed a little bit mealy; but up to that time, they were in good condition.

I would like to call especial attention to these seedling apples. That was one of the features of the entire meeting; it was a sort of inspiration and hope to me, that a State as young as Wisconsin should raise such a large list of valuable seedling apples. I was impressed with the fact that we ought to be growing many more. Mr. Patten, I think, got his inspiration in Wisconsin; I think he came from that State. If we had a dozen such men as Mr. Patten in Iowa, I believe our progress along these lines would be much more rapid.

MR. PATTEN: I arise to make a correction in reference to the seedlings that are produced in Wisconsin. The Plumb Cider, I understand, was brought to Wisconsin from Ohio by the elder Mr. Plumb, who settled near Lake Mills at an early time. It is

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not a seedling of Wisconsin. However, they have made a wonderful effort in the northeastern portion of the State, and a great many new varieties of value have originated in that section. The Pewaukee, however, is not successful in northern Iowa; I do not know how it may be in this portion of Iowa. I am inclined to think it drops its fruit too much.

CAPTAIN WATROUS: I want to relate something for the encouragement of us all that I saw at Boston. There was an exhibit there from Minnesota, a long table of apples, almost as long as across this room, with 110 distinct varieties, all from the product of the seed of one tree, in one year, at ten years from the planting of that tree. The tree was the Malinda. It stood in an orchard. Around near it were, if I remember rightly, the Perry Russet, Tetofsky, Utter's Red, Wealthy and Haas, about five sorts. Nobody knows where the marriages took place, nor which one originated these different apples. But there was that wonderful display from the fruit that was on that tree, in a single year, and these apples compared in appearance very favorably with any other table of fruit that was there, and we had exhibits from the various states and Canada.

PROFESSOR ERWIN: I am very glad Captain Watrous brought out this point, one that I want to urge. Wherever you have two or three trees growing together, where there is a possibility or liklihood of getting some cross of the seed, save that seed and grow it, or if you do not want to bother with it, send it to the station and we will take care of it. I know from experience that nature will take advantage of thousands of combinations, where we will one, in the process of pollination.

A MEMBER: I would like to have the professor describe the Milwaukee apple.

PROFESSOR ERWIN: I think Mr. Branson has been growing that apple.

MR. BRANSON: It is the earliest and best bearer when young that I ever tried. It is a large apple, fine appearing apple. I have grown it for several years. Received it some eight or ten years ago. I expected to furnish some specimens to Mr. Wilson this year, but they dropped a little early. It is a seedling of the Duchess; it resembles the Duchess very much; my trees are principally top-worked.

MR. PATTEN: The Milwaukee in nursery is not as hardy with me as the Duchess, and for that reason I have not grown it to any extent. The last severe winter we had I tested the

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nursery stock and found so much injury to the Milwaukee that I got discouraged. As the gentleman has stated, it drops its fruit too early.

PROFESSOR ERWIN: I think it is equal to the Wealthy for an eating apple, although I think it is largely a cooking apple.

MR. TRIGG: I would like to ask what avail it is that we exert ourselves to raising the apples which are of the same season? The Wealthy stands superior to any fall apple in the city of New York this year, where it was quoted during its season at 25 to 30 cents higher per bushel than any other apple in New York. Now, if the Wealthy is hardy, why bother about 100 other varieties that are not as good as the Wealthy? Why not stick right to that? Why not make it distinctively the great apple of Iowa? I would like to see you boom the Wealthy, because I think it is the best thing we have or are likely to get for twenty years.

THE PRESIDENT: If the committee on the President's Address is ready to report, we will receive the report now.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your committee having carefully considered the interesting and suggestive address committed to its care beg to report as follows:

First—Relative to the share of this society in the work of making a worthy showing of the resources of Iowa, at the coming St. Louis Exposition, we recommend the following resolutions, to wit:

That this society holds itself in duty bound to do its utmost collectively and individually to promote the success of our fruit exhibit there and that our committee on legislation be instructed to co-operate earnestly with others in securing from our coming legislature a generous addition to the appropriation already made for that purpose.

In line of the recommendations that an effort be made to publish portions of our transactions in bulletin form, we recommend as follows:

Resolved, That four hundred dollars or as much thereof as the condition of our treasury will permit be placed at the disposal of our secretary with instructions to prepare, publish and distribute to our members bulletins, especially pertaining to the work of the season, as nearly as convenient, on March first, May first and July first.

Relative to the recommendations that all promising seedlings of our fruits, especially of the apple, be tested at the several experiment stations, we offer the following resolution:

Resolved, That the committee be instructed to procure scions of promising seedlings and have trees prepared under the usual commercial nursery conditions and that all those showing health and vigor enough to make fair nursery trees under ordinary conditions be distributed at the age of three

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years to the several stations for further trial—all failing in such test to be rejected without further expense.

We heartily join in the recommendation that our society hold itself in readiness to fraternize cordially with all our sister societies laboring on lines allied to our own.

C. L. WATSONS,
J. P. JACKSON,
ABNER BRANSON,
Committee.

On motion the report was approved.

THE PRESIDENT: Are there any other committees ready to report?

REPORT OF COMMITTEE ON SECRETARY'S REPORT.

Your committee on the Secretary's report beg leave to report the following:

We recommend that the suggestions made by the Secretary in regard to binding the bulletins, and the appointing of a committee to look after the horticultural interests of the State at the coming meeting of the legislature be approved and commended.

We have examined the various accounts and vouchers and find everything correct.

WM. LANGHAM,
C. G. BLODGETT,
B. SHONTZ,
Committee.

Report approved.

WHAT CAUSED THE UNFRUITFULNESS OF THE TREES IN MY ORCHARDS LAST SUMMER?

BY R. P. SPEER, CEDAR FALLS.

In one of my orchards there are 1,100 Wealthy trees, fifty Duchess, fifty-two cross fertilized apple seedlings top-grafted on the Whitney, and twenty-five different kinds of winter apples top-grafted on two rows of Whitney trees. All the trees in this orchard were planted as root grafts in nursery rows in the spring of 1886, and all of them which I did not intend to use as orchard trees were taken up and sold when they were three years old. The surface soil in this orchard is a rich, sandy loam on a porous subsoil; which consists of sand and clay, and the distance down to water in the driest summers is from eighteen to twenty-four feet. The rows of trees are sixteen feet apart and the distance between the trees in each of the rows varies from sixteen to eighteen feet. This orchard has yielded satisfactory crops of fruit, and in 1901 it produced 900 bushels of first-class apples, and 100 bushels of cider apples. In 1902 it produced a light crop of good apples,

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but last summer the whole orchard did not produce a bushel of apples. Last spring all of the trees were full of blossoms, and in a few days after their petals dropped, I found enough of perfectly formed apples to produce a large crop; but about a week afterwards they began to drop, and they continued to drop until all of them were on the ground. Many of the last Wealthy apples which fell from the trees were an inch in diameter, and some of the Duchess were nearly half grown. But before all of the fruit had fallen some of the leaves turned yellow, and fell on the ground also. In fact both fruit and leaves were affected as they have been frequently during long protracted summer drouths, when they were suffering for want of plant food. I have about 600 apple trees in two other orchards which were planted in 1888 and 1889. They stand in rows twenty by twenty-four feet apart on a good surface soil; but there is much blue clay in the subsoil about twelve feet below the top of the ground; which has interferred with the growth and fruitfulness of the trees in very dry summers. The trees in these orchards were affected by the unfavorable weather last May and June in the same manner as the trees in the first orchard, which I have described above. I have also about sixty apple trees thirty-two years old, standing here and there at a considerable distance above the heads of two sloughs; which dropped all of their fruit also last spring, and twelve of them which stood nearest to the heads of the sloughs began to drop their leaves about the middle of June, and by the first of July they were dead. Several other trees which stood a short distance from the dead trees on higher ground did not lose their leaves; but they made no perceptible growth last summer. Last fall I could find in the three last orchards which I have described only a few scattering, and comparatively worthless little apples. Six years ago I planted two Sudduth pear trees, when they were only two years old, and last year one of them produced thirty-one handsome pears of good size. This year they produced eighty-four smooth and well-developed pears, although they stood near several kinds of apple-trees; which dropped all of their fruit when it was small. They are hardy and vigorous growers; they do not blight, they are very fruitful, and one of them is now twenty, and the other is eighteen feet high. The fruit is not as good as that of some other varieties for eating from the hand; but it is excellent for canning and for jelly. I have many plum and cherry trees of bearing age, which were full of blossoms last spring; but like the apple trees, all of them dropped their fruit prematurely. I have described my orchard sites; the kinds and ages of my trees; how they were affected by the wet weather in 1903, etc., for the purpose of enabling others to come to a correct conclusion in regard to the cause of the unfruitfulness of many Iowa orchards last summer. I offer the following facts to show that it was wet and cloudy weather, which caused the fruit to drop prematurely. The ground was very wet when fruit-trees blossomed last spring, and although it was dry enough to the depth of three or four inches frequently to plant corn on high ground; yet there were heavy showers of rain almost daily during May and June in some parts of northern Iowa, which caused much cloudy weather. Now let us consider the effects of very wet soils and cloudy weather upon growing trees. The crude food which causes trees to grow consists of such dissolved substances as potash, soda, magnesia, lime, prosphorus, nitrogen, sulphur,

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iron, etc., which they obtain from the soil through their roots, and carbon which they get from the atmosphere through their leaves. But all of these things are useless until they have been digested and changed into albuminoids, carbohydrates, etc., by the green substance in the leaves, (called chlorophyll) but chlorophyll cannot be formed without sunshine. Therefore, during very wet weather the crude food materials are comparatively worthless, as they are much diluted with water, and at such times the weather is generally so cloudy that the necessary supplies of chlorophyll cannot be formed in the leaves; therefore if such conditions should be continued long enough, the fruit and leaves on the trees must necessarily starve and fall to the ground. Now it is well known that we had very wet soils and much cloudy weather last May and June, and but little sunshine frequently for several weeks. As the rains fell generally in northern Iowa as local showers in 1903, there was more sunlight and more fruit in certain counties than in others. There was some good fruit in Butler and certain other northern counties last summer; but it was generally on the dryest orchard sites, and on varieties of trees like the Sudduth pear and the Northwestern Greening; which were well supplied with strong and vigorous roots, and the best of leaves. It is very evident that cold weather did not cause our apples to drop last spring, because in past years we have had much heavier frosts as late as the 22d day of May, which did not injure them.

AFTERNOON SESSION.

THE PRESIDENT: The next paper on the program is entitled, "Commercial Orchards for Northern Iowa," by J. S. Trigg, of Rockford.

COMMERCIAL ORCHARDS FOR NORTHERN IOWA.

BY J. S. TRIGG, ROCKFORD.

Forty years ago an eastern man from the fruit-growing section of York State located on an Iowa farm forty miles south of the State line in one of the northeastern counties of the State. He was full of enthusiasm on fruit growing and as soon as he was well settled in his new home he prepared a thirty-acre tract of unplowed prairie soil and set out an apple orchard. Knowing no better he selected varieties common to the East—Russets, Kings, Baldwins, Northern Spy, Rhode Island Greenings, etc., procuring the trees from an eastern nursery. The seasons were favorable, the winters moderate and his young orchard grew and thrived for a period of ten years. It then commenced to bear, and finer apples were never grown in any country. Then came a change in weather conditions—excessive cold, sharp extremes, drouth, siroccos from the southwest. His first crop was his last and at the end of fifteen years not a tree was left and he was a bitterly disappointed man. Following this experience with eastern varieties came the Russian apple epoch—hardy types of apples imported from central Russia

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where drouth, heat and cold were of similar kind as with us in northern Iowa. The Russians were planted, they in the main proved hardy, but as a whole were unproductive and such fruit as was produced was of a quality so poor as to be almost valueless. This was disappointment No. 2, and the most hopeful of apple growers were almost forced to the conclusion that aside from getting a few apples for home use of Duchess and crabs it was useless to try to grow them, and so far as we know not a single attempt was made by any man in the north three tiers of counties of the State to plant an orchard and grow the apple on a commercial scale. About this time, ten or twelve years ago, some new varieties of the apple made their appearance—apples originated from seedlings within the north territory—Wealthy, Patten's Greening, Northwestern Greening, Peerless, and several others less known but quite likely equally as good. These varieties seem to possess when properly cared for the requisite hardiness to stand north Iowa conditions, an unquestioned productiveness and yielding a fruit of very choice quality. For the third time six or eight years ago a few of these much discouraged apple growers mustered up courage enough to try it once again and taking their dearly bought experience and these new varieties of fruit set out a number of commercial orchards varying in extent from five to twenty-five acres. The orchards are now coming into bearing and are bringing their owners a good return. Where such orchards have been properly cared for they are today in a very healthy and thrifty condition and give much promise of future usefulness and profit. There are perhaps a dozen or so of these orchards running across the northern tiers of Iowa counties with not a few equally promising in southern Minnesota. They may be found at Kossuth, Cerro Gordo, Winnebago, Floyd, and other counties. The favorite and leading variety is the Wealthy, an apple which combines as many good qualities as any produced in the United States; next in value comes Patten's Greening, a very prolific variety, hardy as an oak and a very valuable fruit. The surprise of the year has been the unexpected returns from the Northwestern Greening, a winter apple of great beauty, size and good quality—the trees being this year in whatever location grown loaded to the ground with fine fruit. This, a new apple, has been rated heretofore as a shy and unproductive variety, when the truth was that the trees merely wanted age and maturity.

Growers of apples in Northern Iowa find a reliable and profitable market in the great northwest territory where the apples cannot be grown and this year found a ready sale for their fruit at from $1.30 to $2 per barrel for the fruit on the trees.

There is practically no limit to the demand for the Wealthy apple and with the aid of cold storage its season may be very easily extended from that of a fall apple to one of the choicest of winter fruits. We think it is safe to say that each acre of well cared for Wealthy apple trees in northern Iowa will after eight years from planting give their owners an average net income of not less than $60 per acre, and this beats hogs, corn and cows to a finish.

The commercial orchard should have but few varieties, should be given the undivided use of the land upon which it is grown, should be fertilized as soon as it begins to bear, should be planted on high ground and in rows north and south sufficiently close so that at the end of fifteen years the

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branches will interlock, leaving twenty-eight to thirty feet between rows. No pruning other than the removal of crossed or dead limbs, spraying in season, cultivation of the ground up to July and then a cover crop for winter. Hogs and sheep may be given the run of the orchard at proper seasons but should never be herded in it, the cattle should be kept out at all times. The borer kills more trees than all other things put together and must be hunted for and dug out, then if you watch and spray success will come.

THE PRESIDENT: The paper is before you gentlemen for discussion.

MR. HINDS: I have a few questions I would like to ask. I have been coming here and I have been having an experience of my own with the crown gall, or whatever you call it. I have been taking out the trees I planted six years ago, and I fear the result, fearing that there is inoculation of the soil. I have taken out some of the trees with these enlargements upon them and planted new trees in their place. It makes me a little nervous. I have used the tobacco solution, and I have lost out of the twenty-five grafts, twenty of them. On the question of spraying, I would like to ask more minutely as to just the proper solution. I have been spraying for three years. I want to be more definite in getting the mixture. I use the ferrocyanide of pottasium test, but it has not proven very satisfactory; I sometimes err in getting the right solution. I want people with more experience than myself to give me a little information as to the proper mixing of that spray which experiment station chemists tell us we must get right.

PROFESSOR SANDSTEN: If the gentlemen refers to the Bordeaux mixture, you can easily tell after you have made it. The best way for one that is not accustomed to using chemicals, is to get litmus paper; if you get red litmus paper and it is colored blue after dipping in the solution, it is all right. We generally guard against bad accidents by advising the use of six pounds of fresh lime to four pounds of copper sulphate.

MR. PATTEN: Will you tell us how to prepare that?

PROFESSOR SANDSTEN: We generally take fresh lime, of course slack it in a barrel; we use what we term a stock solution; we make up fifty pounds. After it is made, we cover it in order to prevent it from spoiling, and then strain it through a coarse gunny sack, eliminating other materials. Then we make up the copper sulphate, use about five pounds to the gallon of hot water, in a pail or tub; then we have the two

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mixtures in proper proportion; we mix them just before using. If you let it stand any length of time, the mixture is not so effective; but you may keep what you may call a copper solution on hand.

A MEMBER: Speaking of it in a commercial sense, it requires an immense lot of work, mixing in a barrel.

PROFESSOR SANDSTEN; You can mix in larger quantities, if you keep water on top of it.

MR. HINDS: I have found a difference in the lime that I have used; I didn't get the same results.

PROFESSOR SANDSTEN: You will find considerable difference in the lime. It depends entirely on the formation of the limestone. Some limestone contains too much of the magnesium ingredients. But if you get the pure lime you are safer, and six pounds of lime and four pounds of copper sulphate should be sufficient.

In regard to the crown gall question; that is due to a lower organism. We cannot always tell if a tree is infested with it or not. If the case is advanced, you will notice that part of the root is greatly swelled and deformed. If that is the case, the disease has progressed considerably, and you can then throw them out. But if it has just gained a foothold, it is hard to tell. Sometimes it infests entire nurseries from year to year. I have one case in mind, where a block of 500,000 apple trees had been infested; we had to take them all out, and we advised them not to plant any more apples there until the disease had left. They would not take our advice, but planted peaches on it, and the peaches were infested worse than the apples.

It has been demonstrated that the disease will live over in the soil. I wouldn't advise the planting of a tree in the same place.

MR. PATTEN: Could you suggest some application to the soil, where the diseased trees have been taken out, to eradicate the germs of disease?

PROFESSOR SANDSTEN: The only thing to be done would be to put in some other crop. The disease will not live on ordinary crops. It is not a fungus disease; it belongs to one of the very lowest order of plant life.

MR. PATTEN: I thought, perhaps a liberal dressing with lime might affect it.

PROFESSOR SANDSTEN: Lime might affect it. The trouble is you cannot treat it; it is an internal affection and you cannot reach it. I consider it the greatest enemy to fruit growing in

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the southwest, east and south, because we cannot control it if it once gets into a nursery.

A MEMBER: It gets into any nursery more or less.

PROFESSOR SANDSTEN: It is a specific germ disease.

MR. BROWN: If I am allowed to give a little account of the crown gall in my nursery, I will do so. I had it in the nursery quite extensively, and particularly on the Ben Davis. I took scions from that nursery, three-year-old trees and grafted them myself. I removed them a mile and a quarter from yellow clay, rough ground and put them on a sandy hillside and I got the crown gall in that nursery. How did I get it, if it is not carried by the scion? Is it safe to cut scions off a crown gall tree? I do not believe it is.

PROFESSOR SANDSTEN: The disease is so easily transmitted. All we have to do to inoculate a tree is to take a needle and thrust it into an affected bark and then shove the needle into a healthy tree, and you have the disease.

The main trouble with the disease is, it restricts the circulation of the sap of the tree from above. The tree cannot take the water and the mineral salts.

MR. HINDS: I have heard it stated that if you take a Virginia Crab stock and top-work it, that the crown will not attack the crab stock. I thought it was rather a strong statement to make.

PROFESSOR SANDSTEN: I think it is the same as in almost all diseases of that nature. You know some constitutions are immune from all diseases; the same is true with plants and trees. I wouldn't say that the crab is exempt from the disease; I wouldn't say so, because I think it needs to be verified over the whole country; I don't think it has been sufficiently tried.

A MEMBER: Isn't a budded tree as much subject to it as a root-grafted tree?

PROFESSOR SANDSTEN: I would say, I prefer the budded tree so far as the crown gall goes, although I do not think they are exempt; I think the budded trees are apt to have it.

MR. PATTEN: Let me ask you, if you do not think it more likely, that in the case Mr. Brown has cited here, that the disease came from the roots on which he grafted the scions?

PROFESSOR SANDSTEN: It is quite possible. I have found roots infested with the crown gall that were one year old.

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MR. BROWN: Does the State inspection protect the buyer from these diseases? Is not the buyer at the mercy or honor of the nurserymen?

PROFESSOR SANDSTEN: I think it does. In reading over the laws of several states, they read something like this: "San Jose Scale, and other injurious," etc. I think it would come under the general head of injurious diseases. I think the nurseryman is not to blame in that respect. I am sure all nurserymen are trying, as much as possible, to eliminate not only the crown gall, but the scale. It is a matter of interest on their part to look after that.

THE PRESIDENT: We will pass to a paper entitled, "Pear on Thorn Stocks," by Mr. M. J. Graham, Adel.

PEAR ON THORN STOCKS.

BY M. J. GRAHAM, ADEL.

While it is generally known that certain varieties of the pear form a perfect union when grafted on the common hawthorn, *Crataegus mollis*, or perhaps, *C. tomentosa*, this hardy native stock has apparently received but little consideration from propagators. Two reasons are apparent for this neglect; first, the difficulty of growing seedlings of the hawthorn, as the seed usually remains in the ground one year before germinating, and second, the fact that French pear stocks may be readily procured and are quite hardy.

The prime object of this paper is to present a few well authenticated instances wherein the pear on thorn has been a success, hoping it may lead to a more general use of this hardy native stock. In the month of April, 1809, Jacob Brandt had a graft of the White Doyenne pear inserted in a small hawthorn tree, about four feet from the ground, on his farm in Fairfield county, Ohio.

The union was perfect, the tree flourished and produced abundant crops of delicious pears. In 1868, fifty-nine years after the graft was inserted, this tree measured fifty-five feet in height and thirty-five feet across the top, and produced thirty bushels of fruit. The yield in previous years had been as much as thirty-seven bushels.

In September, 1903, this tree measured eight feet and one inch in circumference, four and one-half feet from the ground, sixty-five feet in height, with a spread of branches fifty to sixty feet across, and was in a thrifty condition. It produced a full crop of fruit in 1902, but a light crop in 1903, owing to injury to the fruit buds by heat from a traction engine that was set too near the tree.

On April 11, 1859, Isaac Brandt inserted a graft of the Bartlett pear in the main stem of a hawthorn tree at his home on Capitol Hill in the city of Des Moines, Iowa. This graft made a vigorous growth, produced one and one-

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half bushels of fine large pears in 1863, and continued to bear for twenty-four years, or until November, 1887, when the tree was destroyed by a windstorm. For the foregoing statement I am indebted to Hon. Isaac Brandt of Des Moines, Iowa, who is deeply interested in this subject, and is convinced, after practical tests, that certain varieties of the pear will live longer upon the hawthorn than upon pear stocks.

About thirty years ago, Mr. Massure of Dallas county, Iowa, grafted a number of hawthorn trees, or rather a few limbs in each tree, with scions of Clapp's Favorite pear. The union in this case was also good, and many fine crops of fruit were had from these grafts, until in recent years they were destroyed by blight. In this connection it may be well to state that Clapp's Favorite is quite subject to blight, while the White Doyenne is almost exempt from its attack, and is one of the best pears in cultivation.

In the "American Fruit Culturist," edition of 1875, the author, John J. Thomas, states that Bose and Flemish Beauty succeed well when grafted on the hawthorn, and I believe that Mr. Brandt also found the Flemish Beauty fruitful when so grown here in Des Moines.

In conclusion will say that it is my intention to graft a number of varieties of pears on the hawthorn next spring, and hope to make a report to this society later.

THE PRESIDENT: The paper is now before you for discussion.

MR. TRIGG: Are we to understand you to say that the tree grew to a diameter of three feet?

MR. GRAHAM: Yes, sir; in this case the hawthorn has kept pace with the pear.

MR. PATTEN: I would like to ask Mr. Graham how high from the ground the pear was grafted?

MR. GRAHAM: About four and a half feet from the ground.

MR. PATTEN: This, to me, is a very interesting subject and quite promising. It seems to me we are very much in need of pears in central Iowa, and much more so in northern Iowa, and if we have this hardy stock upon which the better pears can be grown, we ought to feel encouraged.

MR. GRAHAM: We have so close to us in this State, just south of here, down at Knoxville, and from there to the State line a region that has seemed to be well adapted to the pear. There is no question in my mind, if the same interest was taken in the cultivation of the pear in all this region below us, and the attention paid to developing the varieties from the seeds that are best adapted to that region, we would soon have a large variety of pears that would do reasonably well.

MR. FERRIS: I should like to know from this discussion that the pear on the thorn stock is less liable to blight. That is my trouble with pears. I have tried fifteen or twenty kinds and

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they have all blighted to death. If it has that effect to use the hawthorn stock it will be of advantage to know. I have had pears on mountain ash and everything, and I have never yet had a pear that was free from blight. The only pear in our country that is doing any good is the old Kieffer. I should like to know whether the gentlemen who have had the experience with the pear on hawthorn have found it less liable to blight?

MR. GRAHAM: I will answer a part of that inquiry. I think the Kieffer blights very seldom, and the Tyson is one of the most free from it; also the Seckel; the Nelis is also practically exempt from blight.

MR. BOMBERGER: What do you say about the Lawrence?

MR. GRAHAM: The Lawrence does not blight. The only tree I ever lost of that stood next to a Russian tree that blighted and then spread to the Lawrence.

MR. LINTON: If you gentlemen will refer to history, along from 1868 to 1878, you will find that there was quite an experimentation of grafting and budding the pear on hawthorn. I am at a loss to know of any thorn tree that ever would assume body in magnitude, such as Mr. Graham spoke of. It is a family I have been acquainted with all my life. I have seen the Apple Haw grow to 12, 15 and 18 inches, the greatest size I ever saw. I experimented with about 400 grafted on the White thorn; I commenced in 1868 and in 1874 I discarded it, and by referring to history, you will find there is quite a number that went through the ordeal. If you go back to Downing, you will find that he went through the ordeal.

Many pears will grow into trees on the thorn, but there does not seem to be an affinity sufficient, and while it seems to develop a tree as it ought to do, I have no knowledge of any thorn that would ever make a pear tree immune to blight. I do not wish to influence Mr. Graham in any other direction whatever, but these are facts I can substantiate.

MR. GRAHAM: I did not wish to be understood or to infer that the grafting of pear on thorn will cause the pear to be free from blight.

SILAS WILSON: I am very much interested in this subject. Now, I have had quite a large experience trying to grow pears in Iowa on thorn roots and also by top-grafting on the hawthorn stock and I have met with such poor success that I have been discouraging it more or less everywhere, for the reason

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that all my topworking on hawthorn resulted in blight or imperfect union—a lack of affinity seemed to exist in the union. I have planted the standard pears, planted a great many hundred trees, and all went out on account of the blight.

I believe this society will make a mistake to recommend pear growing on the common drift soil in Iowa anywhere. I believe it has come to this fact; there is a pear soil in Iowa; Mr. Graham is fortunate enough to have that soil. Mr. Mathews down at Knoxville also has it.

MR. FORSTER: We have it in Monroe county.

MR. WILSON: I do not wish to say these are the only two places, but I wish to say this, without fear of successful contradiction, that you cannot grow pears anywhere in Iowa, unless you have pear soil. Mr. Mathews can grow pears cheaper at Knoxville than apples, and the same applies to the domestic plum. I was down in that county twice last fall. Mr. Mathews told me, for days in succession there were five or six hundred baskets shipped from Knoxville.

I believe this society ought to be more careful about its recommendations. It appears to me the soil should be white oak soil. Mr. Mathews has this soil. The same applies to Union county, where they make pear growing very successful. Mr. Graham's soil, I understand is stiff clay; if it is not oak soil, it is the next thing to it. I think you will find it largely oak soil where you succeed with pears in Iowa.

MR. PATTEN: Usually I find myself in accord with Mr. Wilson on horticultural topics, but this time I must take a little digression from the remarks that he has made. Fifty years ago or more, it was said in central and western Wisconsin that we could never grow apples in that country to any extent whatever. There wasn't more than one man in twenty or twenty-five that would concede we could ever grow apples to any extent in all the western half of Wisconsin. I lived near Madison for ten years thereafter; long enough at least, to see apples selling from the wagons at 50 cents per bushel; that happened to be a very prolific year for the apple in that region. When I came to Iowa, nearly forty years ago, I found the same condition all over northern Iowa; there was scarcely any body believed we could grow anything but the Siberian crab.

Mr. George Shaw, who came to this society many years ago, told me nearly twenty years ago, that in Decatur county he had grown pears with greater success than he had apples. But we

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have in northern Iowa one pear, and, in the neighborhood where I live, I know trees twelve to fifteen years old; they have never been blighted to any extent; they bear pears as prolifically as my trees bear apples; that is the Langworthy. There is another, that is the Warner.

Now then, I take it, if the old gentleman at Dubuque could produce one pear as hardy as the Langworthy, that will grow on the drift soils of northern Iowa, I think sir, we can, if we only set ourselves about it, produce pears, and I believe it is within our reach, if we only intelligently go to work and stimulate these State institutions to do what we do.

MR. FERRIS: I want to take enough time to go on record discouraging pear growing in northern Iowa. I know of thousands of efforts made and do not know of one successful orchard in the Northern District, and for that reason I want to go on record as discouraging pear orcharding in the Northern District.

THE PRESIDENT: We have another paper entitled, "Do We Need Additional Varieties of Apples in Iowa," by Hon. Eugene Secor, Forest City.

DO WE NEED ADDITIONAL VARIETIES OF APPLES IN IOWA?

BY EUGENE SECOR, FOREST CITY.

This commonwealth covers a large extent of territory. Approximately, it is over 200 miles north and south and 300 miles east and west. Its climate is unlike any other portion of the known world of equal extent. It is very unlike in different portions of the State. From the extreme north to the extreme south the variation in temperature is sufficient to require almost a new orchard list. Sorts that thrive at the south are unknown in the north, and the varieties distinctively northern do not attain their best size and quality in the south. The rainfall differs greatly—probably an average of ten inches annually between the southeast corner and the northwest corner. The soil, too, varies in different parts of the State. Geologists inform us that there are at least five distinct drift formations spread out on its surface—formations as different in character as the primal rocks differ from which the deposit was ground. The porous and friable loess covers a generous portion of the Missouri slope while in the extreme northeast corner may be found an area that antedates all recent glacial epochs.

Erosion has accomplished its work of drainage in some parts while in others there has not been time enough since the scrapers of the Almighty smoothed the surface for the rivers to cut deep furrows through the level glacial plains. Altitude also plays some part in producing the conditions which we find in this great State. An elevation of 1,500 feet on top of the

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Wisconsin drift—underlaid as it often is by fifty feet of blue clay—is quite a different condition from a Kansas bed overlaid with loess at an elevation of 700 feet and in a milder climate by several degrees.

Now if my geological and meteorological and climatological premises are correct it is very easy to conclude that no known variety of apple is equally adapted to all parts of the State. I think we have learned that much during the past fifty years by experience, but we may not have drawn the logical deductions. (I believe that science always observes the fact first and then tries to find a reason for it afterwards.) Taking into consideration the many unlike conditions which confront us, it is plain that a good many localities will have to find varieties adapted to their peculiar environments. Such has been the case in other states and we may expect like effects here. Take, for instance, that magnificent winter apple, Yellow Newtown, or as it is called in some places, the Albemarle. There are a few localities in two or three Eastern states where it flourishes and pays the grower, but not in all of them by any means. I think the same thing is true of several other varieties. The Baldwin, Rhode Island Greening and others are at their best in certain Eastern localities and are very popular but I believe they do not give so good satisfaction west of the Mississippi.

Another fact is well established. About every variety of apple in the United States of any commercial value has been raised in this country for seed. All our best apples are American. And as before stated they have developed in the part of the country where they continue to succeed. Let me note again the Yellow Newtown, Greening and Baldwin, and add to the list the Wealthy, Ben Davis, Jonathan and Grimes; all of these give best satisfaction in about the same climate or soil in which they originated. And this is very easy to understand, because if they had not proved superior to the sorts already known they would never have been heard of.

Perhaps the south half of this state does not need any more kinds,—and yet I now call to mind the fact that all progressive orchardists even in that highly favored region are ever on the alert for new acquisitions in that line. They seem not to have reached that blissful state wherein no possible good is desired. And I am free to confess that the north half of the State has not yet arrived at that ideal condition in fruit growing where we are willing to say with the prophet of old, "Now lettest thou thy servant depart in peace, for my eyes have seen" the salvation of the land we love—horticulturally. Nay, verily, we are not ready to depart until we shall have attained the ideal of our sister state on the north, and shall have produced an apple as hardy as the Oldenburg, as good as the Wealthy, its keeping quality equal to the Malinda and its fruitfulness as satisfactory.

Whoever originates such an apple for the Middle West will not only be pardoned for introducing a new variety, but a monument more enduring than brass awaits him. Future generations shall visit his last resting place and hold his name in grateful memory when the name of some men, now prominent, shall have been forgotten. Such recognition may appear to be only the doubtful reward of posthumous honor, but if the sacred dust of mortal man ever lives, his, the benefactor of his race, shall surely glow with immortal youth when the summing up time is rung out from God's great clock, and equal and exact justice is meted out to the sons and daughters of men. For whoever pushes forward the car of human progress, or adds to

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the sum of human knowledge, or contributes to human happiness shall have a place among the immortals when the jewels of the Kingdom are garnered.

For the encouragement of anyone who may wish to attempt it. I will state what one woman has done in the brief space of ten years. In the spring of 1893, Mrs. T. E. Perkins of Red wing, Minnesota, planted seeds from one Malinda apple tree. In the fall of 1903 she exhibited at the Minnesota State Fair 109 varieties from that planting. Wyman Elliot of Minneapolis, took this collection to the meeting of the American Pomological Society at Boston and I believe obtained the Wilder medal for the exhibit. Mr. Elliot writes me, "I think in this lot of Perkins' seedlings there are several that will keep in an ordinary farmer's cellar till May. In April of this year I cut several kinds that had been kept in an outdoor root house all winter that were in fine condition. I think there are some of them that will have considerable commercial value."

Mrs. Perkins writes me that there were about 250 trees of this planting and that they have not yet all come into bearing. In answer to questions I wrote her, she replied that Perry Russet, Duchess and Wealthy trees were in bearing near by, and farther away were Haas, Minnesota and another Malinda. She writes that only three trees bore worthless fruit, and none of them proved as early as Duchess.

It seems to me that the horticultural hope of this country is not in imported fruits, but in those originated from our best American sorts, or the kinds best adapted to the climate where improvement is needed, and experiments along this line indicate hopeful results.

THE PRESIDENT: The paper is open for discussion.

MR. TRIGG: I would like to ask Mr. Watrous how great the variation in the types of apples produced in that exhibit he spoke of was.

CAPTAIN WATROUS: Just as great as any apples you see on any table on exhibit; there was every sort, size and condition in appearance.

MR. WILSON: I am very much delighted, highly entertained and instructed by that magnificent paper just read by Mr. Secor; but still, I believe it is subject to criticism and I am going to assume the authority to criticise. On general principles, his position is well taken. I believe in producing a pomology that is consistent and adapted to the conditions; I believe that it is the right road to success. But there are some exceptions.

Now, Mr. Secor said that the varieties that he named of the best apples that grew in America, the highest type of apple grown in the world, attained the highest degree of perfection where it was originated. That, on general principles, is true; but there are some great exceptions. The Jonathan originated East; the Jonathan as grown in Iowa is decidedly better than any Jonathan grown east of the Mississippi river; it grows so

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fine and attains so high a degree of perfection, in some of our Northwestern coast states, that you wouldn't recognize it. The same applies to the Spitzenburg that I brought from Oregon the other day. They are grown there and shipped by the carloads, and shipped directly to the European market, direct to Liverpool. Now, they attain a degree of perfection in appearance out there that far excels the apples grown where they originated. There are a few exceptions, although Mr. Secor's position is well taken, and is one we can all agree on.

CAPTAIN WATROUS: I generally agree with Mr. Wilson pretty well, but before saying that this apple is better as grown in Oregon, than those grown in New York where it originated, I should have to have the apple cut and tasted.

MR. WILSON: (Presenting Captain Watrous with one of the apples.) Cut it and taste it.

CAPTAIN WATROUS: (Mr. Watrous cuts the apple and tastes it.) That apple is not as high in quality as the apple grown in the top soils of the eastern hills of New York.

MR. WILSON: I did not claim here in my statements it was better in quality, but that it grew finer in appearance and sought a market in the eastern countries. The New York apple, I have been told by credible men, could have been bought for a a dollar a barrel, while I saw them sold at $1.50, to go direct to Liverpool; English agents competing against each other. There are no apples there now; they are all gone. I think the Captain is correct; I do not think it has so fine a quality as it has East. It is freer from scab though, or anything of that kind. The Jonathan attains as fine a flavor in Oregon, and better than it does East.

MR. REEVES: The paper suggested that we must build up a pomology of our own, originating from varieties of apples and other fruits adapted to our own needs. Now, I agree with that idea; but in producing these varieties, what have we to work from? We must start, in the first place, with some foreign varieties, and in laying this foundation, we have searched foreign countries and brought them here, good, bad and indifferent. We have them now, and our interest lies in the direction of producing seedlings which are suited to our needs. I would not throw a stone at any one who had brought fruits from foreign countries to at first add to our stock from which we produced these seedlings.

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Another point I want to urge, and that is, those who produce seedlings, ought not to introduce it and urge it upon others, unless it takes the place and is better fitted to fill a place on our list than some of the other varieties. For instance, I would not introduce another fruit that comes in competition with the Wealthy, just for the sake of introducing another fruit; if it is not better in some respects, keep it in the background.

CAPTAIN WATROUS: One thing about the Wealthy; we are treated to laudations of the Wealthy, and every word of that sort of talk I agree with, but it must be understood that every mile south you go from the north line of our state, the Wealthy tends to become less and less valuable, until you get to Missouri, they do not think much of the Wealthy; so in Kansas; it is scarcely anything more than a summer apple. All these things we should accept, because it is taking it straight away from its habitat. Now, if some man here would originate a fruit that would be worth as much to us right across this section, as the Wealthy is for the people of St. Paul; that man would add millions to the wealth of this state. Therefore I think we ought to keep trying.

MR. FERRIS: I want to agree with Mr. Reeves. It is not best to recommend new fruit, as long as its superiority cannot be established over the fruit whose place it is to take. While I admire Mr. Secor's paper, as I have every paper he has ever read, I agree with Mr. Reeves also, that by importation we have also attained something along the line of seedling production that has been of value to us. That is a good idea, and the paper is a good one.

THE PRESIDENT: We have a gentleman with us this afternoon who represents a state that has produced a wonderful number of seedlings adapted to that state; many of them I find in northern Iowa. This gentleman is the new professor of horticulture at Madison, Wisconsin, Professor Sandsten.

PROFESSOR SANDSTEN: Mr. President and Members of the Society: You might ask what we are trying to do at our experiment station. We are not doing very much. We are looking along the line of developing the plum, *Prunus Americana*.

This year we fruited 6,000 seedlings of the American type. After the fruiting season was over, about six or eight men were engaged with hatchets and grub hoes to cut down the trees; we had twenty-five left about a month ago. These twenty-five represent what we got out of the 6,000 seedlings; I expect after

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another fruiting season we will have about six or eight trees left. Now, that represents a great deal of labor and care for a number of years, to get only a few seedlings. Of course, we claim that the seedlings so produced are superior to any in the market, and we shall try for a few more years, and after that we will propagate and send them out over the State to be tried further.

A MEMBER: What seeds do they represent?

PROFESSOR SANDSTEN: The seedlings now selected represent principally the Wyant. The breeding has been done promiscuously without any attempt to keep record of the parents, except on one side, and on that account I think we have lost; I do not believe in promiscuous breeding. While it gives results, the result is too uncertain; it will be far better to choose parents under favorable conditions and get your trees; you do not have to spread them over so large a territory and the results would certainly be better.

We have not done very much along the line of development of apple seedlings. We have a few that are proving quite hardy, but we have not placed them on the market; we do not think them superior to some standard varieties, and if they are not better than the standard varieties they will never go any farther than they are now. We do not intend to send out any varieties except they are better than anything on the market; there are enough poor varieties.

We are looking along the line of bud investigation, trying to discover, fertilizing, temperature and other conditions favorable to the development of fruit buds. There are some of these experiments that have not as yet been published; but, so far, we have found the condition of the latter part of the growing season has a great deal to do in the fruitfulness or productiveness of the tree the following year. The time at which the fruit buds are formed, is influenced by food supply and by temperature and moisture, and if these conditions are favorable we may expect a good year; if not, the yield will be less.

Then we have been working along the line of the influence of pollen under certain conditions. We have found we can take apple pollen and pear pollen and ship them from one state to another. The pollen is a spore, it germinates and grows like a spore, and bearing that in mind, we have a new field before us in plant work.

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We have also been working along the line of cover crops. Some of our fruit trees are winter killed, and to prevent it we find it necessary to cover the soil to keep it from freezing too deeply, and we find by experimenting with oats and clover, we can prevent winter killing. The difference in the penetration of the frost between the uncovered ground and the ground covered with oats and clover, varies as much as seven or eight inches. The benefit in many instances is due to the fact that the ground becomes frozen so deeply as to stop the water supply from below. You have probably noticed in the winter, sometimes the branches are shriveled up, due to lack of water, and so we are looking towards preventing the winter killing by the use of suitable covering.

MR. REEVES: What are you doing along the line of cherry growing?

PROFESSOR SANDSTEN: Some years ago we collected a number of wild cherries from different parts of the State and also some from Pennsylvania. We started first with the idea of simply selecting the best trees and from the fruit of the best trees to get new seedlings. The result of the work so far has been very disappointing; the seedlings have gone back instead of forward and we are almost tempted to give it up, at least along the line we started, and try by cross-pollination to produce some new hybrids from crossing.

We have been working along the line of insecticides and fungicides. We have controlled the brown rot of the plum and the codling moth and the apple scab by the use of the Bordeaux mixture. We have found we can keep the curculio in check—this year we did not lose a half bushel of plums through the brown rot; we had it practically eliminated.

We have also carried on cranberry tests, for the central part of the state, where the bogs and swamp lands are very numerous, and there is a field there for agricultural development which will eclipse the famous Cape Cod bogs. The trouble with all our Western enterprise is that we are too extensive and not intensive enough; we are trying to cover too much ground, and consequently we are a little behind in cranberry growing.

A MEMBER: Have you experimented with any dust spraying?

PROFESSOR SANDSTEN: We have had no experience with the dust spraying.

MR. REEVES: How do the native cranberries compare with the cultivated?

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PROFESSOR SANDSTEN: The difference in size can hardly be imagined. The native cranberry compares in size with the cultivated one, as the Virginia crab with the Northwestern Greening apple.

MR. JACKSON: This cranberry on our market is the native cranberry?

PROFESSOR SANDSTEN: Yes, sir; the most are native. The industry now, as it stands, is not extensive. This year we produced in the neighborhood of 200,000 bushels, and the price has varied from $2.50 to $3 for the fancy berries, and the yield per acre, under right conditions, may be as high as 200 or 300 bushels; these are exceptional yields, however. So, there is a great profit in the industry, only the cost of preparing the land is very expensive. We have in three counties, several hundred thousand acres of swamp land, well adapted to cranberry growing, and if we only could have legislation to control the water supply, it could be developed—but I am sorry to say, some of our Iowa people have gotten up there and bought up some of the swamp land and are trying to raise corn on it; after they are through, they will be wiser than when they came there.

MR. TRIGG: What are these bogs?

PROFESSOR SANDSTEN: They are peat bogs, composed of moss and soil, underlaid entirely with quicksand, to the depth of several feet.

MR. TRIGG: Which are the four best apples you raise in Wisconsin?

PROFESSOR SANDSTEN: Now, I will place the Wealthy at the head of the list; the Oldenburg; and then I am in doubt as to which one I should place next. The Northwestern Greening is a splendid apple with us, and I am in favor with the Windsor Chief for a winter apple. The Pewaukee does well in certain restricted localities.

MR. REEVES: Can you give us the origin of the Windsor Chief?

PROFESSOR SANDSTEN: I cannot.

A MEMBER: Does it pay in Wisconsin, in these cranberry swamps, to gather the fruit in its natural state?

PROFESSOR SANDSTEN: No; it does not. A man can never expect something for nothing. The cranberry industry from a native point of view is a failure. Originally these bogs were covered with cranberries, but due to our forest fires, they were entirely destroyed. When we consider, to get a bushel or two,

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we have to crawl over an acre or two, getting wet or cold, there is not much profit in that, and you cannot get more than half price for such berries. It is just like planting apple trees without taking care of them; you will be disappointed.

A MEMBER: How do you prepare the ground?

PROFESSOR SANDSTEN: That is expensive. First, the natural soil is to be removed with a scalping plow, drawn by four horses, with regular bog shoes on, so that they will not go through. The top is removed and placed in windrows, forming embankments. When that is done, from two to three inches of sand is placed on the top of the soil and the vine is simply pulled out of another plantation and placed on the banks, with a stick, poked through the sand into the peat, and they will grow,

I will not try to occupy more of your time. I am sure I have thus far enjoyed your meeting and have profited by your experience and the many papers presented.

THE PRESIDENT: We have Mr. Brown here with us from Illinois, and we would like to hear from him.

MR. BROWN; I have not much to say to you. I feel somewhat lonesome when I get up here and look around over the tables and do not find my friend, Ben Davis. Hancock county, Illinois, produces a fine Ben Davis. We wish we had them this year, when we didn't produce it and haven't much of anything else. Of course, we have the Grimes Golden and Jonathan and some Winesap; outside of that we had but very little this year, with the exception of some isolated orchards, we are pretty near a total failure.

I speak for my county. I do not know how the southern part of Adams is. There is one thing certain; we may be like the rest of the folks; if we do not see something in view, we get lazy and forget to spray. Our apple trees suffered the same as yours did and I am fearful of the outlook for another year; they lost most of their leaves in October and they were a sorry looking lot. I do not know what the outcome will be. The general outlook for fruit seems to be fair, but the outlook for planting and taking care of orchards is not A No. 1. We have got more orchards in blue grass than in anything else.

We have an ideal soil for the Ben Davis; we think we produce the finest Ben Davis out.

We do not produce good cherries. I am satisfied in peaches we hit it oftener than you do. I had a fine lot of pears this year; I didn't have any blight. I am in clay ground, white oak

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ground, the same as Mr. Wilson was speaking of here; the pear does fairly well with us.

A MEMBER: What is the Sudduth pear doing down there?

MR. BROWN: That is a tree that I know is bearing in Hancock county.

With regard to small fruit, our strawberries were fine. We had some crops that were very fine, at Nauvoo, some twelve miles above us. There was a great quantity of the Burbank shipped from Nauvoo.

Before I close, I want to say one word in regard to a little orchard situated in Iowa; it is not more than a mile and a half or two miles across the river from me, that bore a full crop of apples this year, situated in hardpan; it held water so bad, the owner couldn't plant a tree and he got a big crop of apples. It holds water like a crock, and it produced apples this year, when all around on my soil across the river we didn't have any.

MR. PARSONS: There is a thing I want to inquire about. We have been stuck in the north part of the State with the crabs to work our apples this year; they have been very disappointing with me. Early in the season they started and made a vigorous growth and after they started and grew two or three inches they ceased to grow, and the foliage became more or less diseased and some of it dropped off. I noticed that all the scions we worked in this year made a feeble growth. Is that so all over?

MR. PATTEN: In answer to Mr. Parson's question about the crabapple for stocks, I can only say, that the crabapple of all varieties, or nearly all varieties that have crab blood in them, like the Virginia crab, and all that class of apples, excepting Whitney's No. 20, and possibly one other kind, were badly affected in the foliage by the rust in the nursery; they were generally affected to a degree to almost destroy them, and it is so over the entire country, not only in northern Iowa but also in Minnesota; the crabapple this year has been certainly very disappointing. My mind goes back perhaps fifteen years ago, when the foliage in Iowa and around Sioux Falls, Dakota, was seriously injured. I think, perhaps we shall have to revise our topgrafting list and use less varieties that have crab blood in them.

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SOME GRAPES THAT I HAVE RAISED.

BY HENRY LAU, DAVENPORT.

This article will attempt to relate experience concerning different varieties of grapes, as grown by the amateur for home use. Some years ago, when a prosperous agricultural fair society, now defunct, offered very liberal premiums for the largest and best collection of grapes, it was deemed advisable to plant of many kinds; about fifty varieties were secured in the course of time, the entire plantation, at present amounting to one hundred and twenty vines. A southern hillside not being available, they were set out eight by eight feet apart between orchard and garden, sheltered from all sides except the south, the ground sloping gently to the west, the soil a dark prairie loam, well drained by tile.

The vines are pruned in the fall, renewing when possible, and all, except Concord, are laid down and covered with earth. A good deal of summer pruning is done, with the aim of increasing the size of bunches, but it rather seems to increase their number. Only one variety, Concord Muscat, a white grape of astringent sweetness, persists in being a shy bearer. Moore's Early and Norton's Virginia produce a sufficiency; all the rest come to the front with from three to five times as much bloom as the vine can mature grapes in an average season. Not more than one bunch should be left to each shoot, and even this is too much for late or delicate kinds, or such as make very large bunches. If highly flavored and well ripened fruit is desired vines must not overbear; some kinds are permanently crippled by excessive fruiting.

While it is easy enough to obtain bloom, many kinds do not set well, and a large and promising cluster of bloom will make only a loose, ragged and imperfect bunch of grapes. This is apt to be worse if the vines are exposed to a strong wind during blossoming time. Lindley, Creveling, Amber Queen, August Giant, and in some seasons, Agawam, are defective in this respect. On the contrary, some varieties are too compact, and the berries are apt to force each other off the peduncle. Elvira, Diana, Woodruff and Diamond are of this kind; it might be advisable, when the fruit has set, to thin out with small scissors, as is done with exotic grapes. It is recommended to plant late or delicate varieties on the south side of a building, or even a tight board fence; in such a position they are comparatively immune from disease and even Catawba ripens by the 15th of September. Where a large space is thus to be covered, the spur system of pruning will have to be used; the writer has a vine on his barn fifty feet long.

The quality of fruit varies much in different soils, seasons and degrees of culture; a year like 1902 produces grapes that are not fit to eat. Under such unfavorable conditions, some sorts show weakness of foliage, losing it to some extent, and of course not maturing the fruit. Vergennes, Lindley, Brilliant and Delaware have this fault. In other sorts the berry is attacked by rot and mildew, and in this connection it is noticed that Concord and Worden are as susceptible as the rest. While the writer always puts paper

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sacks on the grapes, he has never succeeded in doing it early enough to find out whether they are a protection from disease or not.

During a period of thirty-five years, it has happened but once that the new growth was killed by spring frosts (May 14, 1895), and in the winter of 1898–1899 the roots were more or less killed even where the vines had been laid down and covered. Of these Woodruff seemed to be the only one that was not injured. It is a showy grape, rather pulpy but very sweet when well ripened and most people relish it. In favorable seasons it makes bunches too large for a two-pound paper sack. It is very apt to overbear and if the clusters are large they ought to be at least eighteen inches apart. This also holds good for Diamond, which of all the varieties tested, makes the heaviest clusters. It has the best flavor of the white Concord seedlings, but one is easily surfeited eating it. Its berries are apt to ripen unevenly on the same bunch, the skin is very thin, liable to crack and subject to disease.

When it comes to sampling grapes, it is advised to start on the flavored ones, such as Duchess, Prentiss and Lady Washington and finish on those of a strong and pronounced aroma like Agawam, Barry and Catawba. The taste of Duchess is like that of California grapes, one can eat a great many of them, it makes long and fairly compact bunches. The berries are dotted with minute specks. The finest white grape for eating, as well as exhibiting, is Lady Washington. When properly cared for, it makes immense, cone-shaped bunches of translucent berries. On a three-wire trellis, eight feet long, eight or nine bunches are about right; the same rule will answer for Jefferson, Wilder and Iona; these, as well as Prentiss, Catawba, Goethe and Lady Washington should be planted on the south side of a building, and each vine placed on a bushel of bones. Of course they ought to be laid down and covered with earth and in case of a snowless winter, it is well to mulch for root protection. Then if the growth and fruiting is carefully controlled during the early summer, they will be free from disease and the fruit will be fit for a king.

The finest *early white* grape for general cultivation is Green Mountain, the finest *early black* is Jewel; it is among the blacks what Delaware is among the reds; it produces small, compact bunches of fine quality. Moyer gave poor satisfaction; it was many years before it came into bearing, and its flavor is much inferior to Delaware. Empire State makes long bunches of good quality, but in some seasons its berries will shrivel and drop, like those of its parent, the old Hartford. The Munson seedlings received from the lamented Mr. Fluke have only borne this year and last, and both seasons being unfavorable, judgment is suspended. Nor will grapes be as fine and large when they first begin to bear, as later on when the vine is well established. We must not omit Brighton in our list; it ought to be planted among good fertilizers and not permitted to overbear; under favorable conditions it makes beautiful bunches of the largest size.

Rogers seedlings produce a variety of distinct flavor not found elsewhere. Barry is a good black grape, a short, very broad bunch and large berries, flavor rich and spicy. It is thick-skinned like Agawam; this one has an aroma all its own; it should be in every collection. Herbert is a fine black grape, rather early and fine quality. The above can be grown with ordinary care, but Goethe is rather late, and in a season like the last will not ripen in the garden; on the barn it never fails to mature by the first of October.

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It finishes the season, together with Norton's Virginia, the only specimen of the Aestivalis family here present. Though late, it never fails to ripen its fruit with ordinary care, is entirely free from disease, its fruit can remain on the vine until well in October. The berry is rather small and has too many seeds, but its quality is superior to any of the black Labruscas. Being entirely distinct in appearance, it, as well as Elvira, should form a part of every grape exhibit.

Pocklington and Niagara may be valuable market grapes; the writer has but one specimen of each and that is enough. Martha is a little better. Rebecca better yet, but too delicate. The Eldorado is spoken very highly of by Eastern growers, it has been frequently ordered, but the honest nurseryman always sent something else. If any of the assembled brethren has the genuine article to sell, he will please rise and signify his ability.

EVENING SESSION.

THE PRESIDENT: The society will please come to order.

MR. REEVES: We find there are no exhibits from the Southern District and the exhibits from the other parts of the State are fine and large, especially from the north, where we grow the best apples. It has been suggested that on account of the large exhibits the money for the Southern District be divided between the Northern and Central Districts. We should have some expression in regard to this matter.

Upon motion duly made and carried the premiums for the three districts were ordered to be appropriated among the districts represented.

THE PRESIDENT: We will now take up the program. The first paper is entitled, "Phenological Notes," by Miss Charlotte M. King, of Des Moines.

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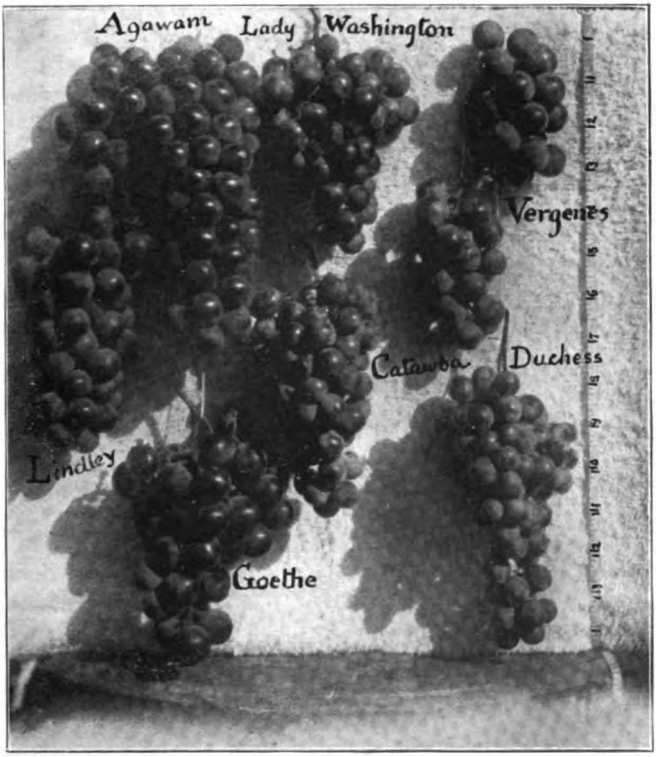

Clusters of grapes from Scott County showing, comparatively, the size of bunch and berries of the different varieties.

Photograph from H. Lau.

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PHENOLOGICAL NOTES FOR 1903.

BY CHARLOTTE M. KING, AMES.

Plants are affected by two classes of influences, those from without, and those from within. Of recent years our attention has been much attracted to the effort of outward conditions upon plants.

We have all noticed that different localities have plants characteristic to them. We have a distinct impression, for instance, of the flora of the dry southwest, of swamps, of alpine regions, of meadows, etc. Dry atmosphere makes necessary a reduction of water-loss, so we have lack of foliage, water-storing systems, and deep set breathing pores. Plants of moist localities have many stoma, and frequently special pores for the giving off of water; they have smooth leaves. Alpine plants are marked by universal lowliness of stature, by protective hairs, by strong roots, and by abundant bloom. The beds of mountain buttercups, forget-me-nots and primroses, are masses of gold, pale blue and purple. Everything seems to be planned for a short activity and a long rest period. Careful observers will find even individual species differing somewhat according to the places they inhabit. One generally distributed plant, our Bur oak, is a marked instance of this; we may have noted the difference between trees of the rich uplands, and higher river woods, with the more diminutive specimens of exposed barrens.

That study of plant life which has to do with conditions, habits and neighbors of plants, has a distinct division which considers the chronology of plant life or its relations to seasons. Under the influence of climate, are established the order of life periods, periods of rest, of growth and of the performance of all the various functions necessary to life; in response to temperature conditions largely, are developed annual habit, storage systems, regular fall of leaf and adaptations for suspense of activity. The interesting coincidence of blooming time of certain plants with the appearance of certain insects which pollinate them, indicates a peculiar response of the plant to its conditions, and has an indirect relation to seasonal influences. There is, however, no isolation of the facts of phenology from the unity of all botanical truths. Phenology is simply one view of plants from the standpoint of seasonal adaptation.

But to turn to our list, as the fixed habits of plants are an expression of what the climate has been for an indefinitely long period of time, the wake robin of March comes out, because with a certain given food supply which it possesses it is ready for work after just so much sunshine and moisture as nature has established for the year up to that time. We speak of storing sunshine; every plant is a living storage system for sunshine. Notice that the early plants of our list are none of them annuals. When the Trillium is ready for bloom, the annual is but a seed, the tiny embodiment of potentiality, that requires much preparatory work and waiting, in Nature's workshop, before the organism is equipped for the crowning effort of blooming and fruiting.

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Although we have the maple blooming in March and its seeds ripe a few weeks later, the dandelion blooming in April and its seeds ripe before June, we have no annual on our list in bloom till July. The annual works rapidly during the warm months and before frost seed is matured for a long rest period.

In the deciduous tree, we have a period of rest, corresponding to a season unfavorable for growth. So nature's law is in part a written code, expressed in the structure, functions and habits of living plants. So a knowledge of the times of things will greatly assist in correlating our knowledge of plants; and to a certain degree, elucidate many natural laws and methods. I have spoken of the direct relation of blooming time, period of leafage and fruiting time to climate. Other considerations like that of range have an intimate bearing upon the phenomena of plants and of such conditions, these phenomena are an expression.

Porcupine grass (*Stipa spartea*) is recorded for the prairies of Illinois and northern Michigan and northwest. We are in the southetrn part of the north and south range for this grass; we find it blooming from June to July; at this point. June 4th, Blue grass (*Poa pratensis*) is found from the mountain ranges of northern Pennsylvania to New England and north. We see the northern tendency of this plant's distribution. It blooms here June 1st.

Wake robin (*Trilium nivale*) extends from the rich woods of western Pennsylvania and Kentucky to Minnesota and Iowa; it blooms March to May; here in the southern part of the range, it is recorded for the last week of March.

Paper birch (*Betula papyrifera*) extends from northern Illinois and Minnesota far north and west; it blooms April to May; here the middle of April.

The beautiful fringed gentian is found in low grounds from New England to the Dakotas and south to Iowa, Ohio and in the mountains of Georgia; the blooming time is September to October; in Iowa, the last of September.

Kalmia cristata, one of our prairie grasses, extends from the dry hills of Pennsylvania to Illinois and Kentucky, north and west; blooming time July—September; here, the latter part of June. It is a general truth that plants of northern range bloom early; this is not coincidence merely, but a fact of phenological significance. While Iowa has many species of plants related to northern and eastern flora, the southern and western species have the preponderance in both number of species and in abundance of plants of these species.

The Partridge Pea (*Cassia Chamaecrista*) is found in sandy fields southward blooming July to September; here the middle of July The Blazing Star, Minnesota and Kansas southward blooms August to October; here in August. The Goldenrod (*Solidago Missouriensis*) grows on dry prairies from Wisconsin and Indiana south and west; it is recorded for autumn; here, the last week of July. Bellflower (*Campanula Americana*) grows from western New York to Minnesota, south to Georgia and Arkansas; July to September; here June 28. Vervain (*Verbena stricta*) barrens and prairies, Ohio to South Dakota, south to Texas and New Mexico; June to September; here, 1st of July.

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Papaw (*Asimina triloba*), western New York and Pennsylvania to Illinois, southeastern Nebraska and south; March to April; Iowa, April 1st.

Closed Gentian (*Gentiana Andrewsii*), moist grounds, New England to Minnesota to northern Georgia, August to October; here, September.

We may note from the foregoing, that plants of distinct southern range are late bloomers here. It is interesting to note the place of altitude in the distribution of plants; northern plants are often found in the mountains of the south; on the other hand, several species of southern plants follow up the valleys of Iowa from the southeast. This is one phase of temperature or climate conditions. Let us take up some plant of very general distribution throughout the United States. Wood sorrel (*Oxalis violacea*), rocky open woods, most common south; May to June; here, first week of May; long period of bloom.

Evening Primrose (*Œnothera biennis*), throughout United States, June to October; here, middle of May.

Columbine (*Aquilegia Canadensis*), April to July; here, middle of May.

White Water Lily (*Nymphaea tuberosa*), western New York and Pennsylvania to Michigan, eastern Nebraska and probably southern states; July to September; middle of June here.

Cardinal flower (*Lobelia cardinalis*), New Brunswick to Florida, west to northwest territory and Kansas, July to September; here, last week of July.

These possess, it is evident, a wide range of adaptation to climate; notice that they adhere more closely to conditions of habitat; and that they have, most of them, a prolonged blooming period. The sunshine hastens bloom; whilst conditions reducing soil temperature retard it. Conditions of exposure. soil and moisture have much to do with a plant's choice of location.

We may divide Iowa plants into distinct general groups, according to the habitat in which they are found: 1. Common rich prairie. 2. Dry prairies and knolls. 3. Meadows. 4. Deep moist woods. 5. Alluvial bottoms. 6. Upland woods. 7. Wet and swampy places, etc. These conditions of exposure and moisture are related to blooming time and leafage period. Knowledge of range and habitat have importance in the transplanting of native species and their naturalization to new situations.

We may now consider a class of plants which, by their wide adaptation to many habitats, and many climates, exhibit strong organizations and persistent growth, and also earn the unenviable name of weeds: Purslane —European; blooms all summer. Dog-fennel—European; June to November. Great ragweed, July to October. Dandelion—European; April to November. Foxtail, July to September. Squirrel--tail grass, July to August.

Note the wide range of the above examples, also their long period of bloom, their frequent perennial habit and their lack of susceptibility to frost. So the long period of bloom and general hardiness (phenological conditions) contribute to the excellent aggressive quality which gives weeds the ascendency in competition with the more tender varieties of cultivated plants.

The phenology of Alpine plants in connection with temperature records, and means of protection and pollination, would be very instructive, as also such study for any locality with peculiar characteristics. The complete phenological record of a single species in a locality, taken in connection with all known facts of its seasonal environments would also be instructive.

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While phenology is a subject interesting in itself, as it is a means of introduction to the plant world about us, it also has it practical bearing in treatment of weeds, determining hardiness of varieties, selection of desirable ornamentals, winter care of plants, exposure or placing of plants, time of planting, and transplanting and succession of planting.

Some of the botanical questions to which phenology is related are problems of variability, distribution, adaptation, pollenation, protection and food supply.

We append a few observations made by botanical students upon the blooming time at Ames and in other parts of the State, for 1903.

RECORD FOR AMES, 1903.

Months.	Days.	Degrees of Temperature. Max.	Min.	Mean.	Rainfall in inches.
February.					
Average for month	1-28	30.5	8 1	19.5	.94
March.					
Average for first week	1- 7	39.0	29.0	34.2	....
Average for second week	8-14	32.0	31.0	40.5	....
	15	38.0	30.0	....	....
	16	41.0	34 0	....	....
Soft Maple (*Acer dasycarpum*)	17	54.0	41.0	....	....
	18	72.0	41 0	..	....
	19	78.0	51.0	....	....
	20	57.0	29 0	....	..
	21	39.0	27.0		....
Average for third week	15-21	53.0	36.0	44.7	....
Average for fourth week	22-28	45.0	28 0	36.3	...
Average for fifth week	29-31	53.0	31.0	41.7	....
Average for month	1-31	43.2	31.0	39.6	.61
April.					
Red Elm (*Ulmus fulva*)	1	79.0	46.0	...	..
American Elm (*Ulmus Americana*)	2	68.0	34.0	..	....
	3	44 0	30.0	....	....
Spring Beauty (*Claionia Virginica*)	4	54.0	27.0		....
	5	62.0	42.0	....	....
	6	55.0	32.0	..	....
Dandelion (*Taraxacum officinalis*)	7	38.0	33.0	...	....
False Rue Anemone (*Isopyrum biternatum*)	7	....	....	..	...
Shepherd's Purse (*Capsella bursa-pastoris*)	7	....	....	..	....
	8	76	29	....	....
Average for first week	1- 7	61.0	32.0	46.5	....
Bloodroot (*Sanguinaria Canadensis*)	9	72	39	....	....
Weeping Willow (*Salix Babylonica*)	9	72	..	....	....
Willow (*Salix rostrata*)	10	59	38	....	....
Forsythia (*Forsythia viridissima*)	10	....	....	....	....
Dutchman's Breeches (*Dicentra cucullaria*)	11	80	53	....	....
Toothwort (*Dentaria laciniata*)	12	71	51	....	....
Sedge (*Carex Pennsylvanica*)	13	51	24	....	....
Marsh Marigold (*Caltha palustris*)	13	....	....	....	....
Dog-tooth Violet (*Erythronium albidum*)	14	50	31	..	....
Average for second week	1-14	66	38	51.7	....

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RECORD FOR AMES, 1903—CONTINUED.

Months.	Days.	Degrees of Temperature. Max.	Min.	Mean.	Rainfall in inches.
April					
Rue Anemone (*Anemonella thalictroides*)	15	52	38	....	....
Blue-bell (*Mertensia Virginica*)	16	56	44	....	....
Small-flowered Buttercups (*Ranunculus abortivus*)	16	....	....	....	....
Wind-flower (*Anemone nemorosa*)	16	....	....	....	....
Wild Plum (*Prunus Americana*)	17	66.0	38.0	....	....
Buttercup (*Ranunculus septentrionalis*)	18	70.0	47.0	....	....
Blue Violet (*Viola cucullata*)	18	....	....	....	....
Yellow Violet (*Viola prubescens*)	18	....	....	....	....
Shad-flower (*Amelanchier Canadenses*)	18	....	....	....	....
Mouse-ear (*Antennaria plantaginifolia*)	18	....	....	....	....
	19	58.0	51.0	....	....
	21	62.0	47.0	....	....
	21	58 0	38.0	....	....
Average for third week	15-21	60 8	43.9	52.1	....
Cultivated Cherry (*Prunus Cerasus*) Bessarabian	22	59 0	38.0	....	....
Spiraea (*Spiraea Thunbergii*)	22	....	....	....	....
Missouri Currant (*Ribes aureum*)	22	....	....	....	....
White Birch (*Betula alba*)	22	....	....	....	....
Wild Sweet William (*Phlox divaricata*)	23	61.0	32.0	....	....
Bleeding Heart (*Dicentra spectabilis*)	24	55.0	42.0	....	....
	25	58.0	35.0	....	....
Cultivated Strawberry (*Fragaria*)	26	66.0	29.0	....	....
Ground Ivy (*Nepeta Glechoma*)	26	....	....	....	....
Common Plum (*Prunus domestica*)	26	....	....	....	....
Wild Gooseberry (*Ribes Cyonosbati*)	26	....	....	....	....
Wild Strawberry (*Fragaria Virginiana*)	26	....	....	....	....
Cultivated Gooseberry (*Ribes Grossularia*)	26	....	....	....	....
Cultivated Currant (*Ribes rubrum*)	26	....	....	....	....
Wild Currant (*Ribes gracile*)	26	....	....	....	....
Bellwort (*Uvularia perfoliata*)	27	68.0	43.0	....	....
	28	68.0	52.0	....	....
Transcendent Crab (*Pyrus prunifolia*)	29	64.0	35.0	....	....
Average for fourth week	30	46.0	27.0	....	....
Average for fourth week	21-30	78.0	47.0	62.8	....
Average for month	1-30	66.0	40.0	53.2	1.9
May.					
	1	59.0	29.0	....	....
	2	51.0	41.0	....	....
	3	64.0	39.0	....	....
Bladderwort (*Staphylea trifolia*)	4	74.0	44.0	....	....
Star grass (*Sisyrinchium angustifolium*)	4	....	....	....	....
Bur oak (*Quercus macrocarpa*)	4	....	....	....	....
Cultivated Apple (*Pyrus Malus*) Duchess	4	....	....	....	....
Cultivated Pear (*Pyrus communis*)	4	....	....	....	....
Bird Cherry (*Prunus Pennsylvanica*)	4	....	....	....	....
Cardamine (*Cardamine rhomboidea*)	4	....	....	....	....
Ground Plum (*Astragalus caryocarpus*)	4	....	....	....	....
Dandelion in seed (*Taraxacum officinale*)	5	62 0	50.0	....	....
Lousewort (*Pedicularis Canadensis*)	6	69.0	42.0	....	....
Yellow Sorrel (*Oxalis corniculata var stricta*)	6	....	....	....	....
Hairy Puccoon (*Lithospermum canescens*)	7	70.0	45.0	....	....
Hawthorn (*Crataegus mollis*)	7	....	....	....	....
Average for first week	1- 7	64.1	41.4	52.7	....
	8	72.0	44.0	....	....
	9	78.0	53.0	....	....
Meadow-Rue (*Thalictrum dioicum*)	9	....	....	....	....
Dwarf Iris (*Iris pumila*)	9	....	....	....	....
Tartarian Honeysuckle (*Lonicera Tartarica*)	9	....	....	....	....
Puccoon (*Lithospermum angustifolium*)	9	....	....	....	....
Corydalis (*Coyrdalis glauca*)	9	....	....	....	....
Honeysuckle (*Lonicera cærulea*)	10	76.0	55.0	....	....
Crowfoot (*Geranium maculatum*)	11	73.0	55.0	....	....
	12	74.0	58.0	....	....

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RECORD FOR AMES, 1908—CONTINUED.

Months.	Days.	Degrees of Temperature. Max.	Min.	Mean.	Rainfall in inches.
May					
Buckeye (*Æsculus glabra*)	13	68.0	56 0	....	....
Thaspium (*Thaspium aureum var trifolium*)	14	76.0	55.0	....	....
Columbine (*Aquilegia Canadensis*)	14	....	....	....	....
Average for second week	8- 14	73.9	58.0	65.9	....
Speedwell (*Veronica peregrina*)	15	78.0	53.0	....	....
Spid-rwort (*Tradescantia Virginica*)	15	....	....	....	....
Ellisia (*Ellisia Nyctelea*)	15	....	....	....	....
Mountain Ash (*Pyrus Americana*)	15	....	....	....	....
Water-leaf (*Hydrophyllum Virginicum*)	15	....	....	....	....
Painted Cup (*Castilleia sessiliflora*)	15	....	....	....	....
Wild Honeysuckle (*Lonicera glauca*)	16	81. 0	55.0	....	....
False Salmon's Seal (*Smilicina stellata*)	17	75 0	58.0	....	....
Golden Ragwort (*Senecio aurcus*)	18	81.0	64.0	....	....
White Clover (*Trifolium repens*)	19	71	57	....	....
Vetch (*Vicia Americana*)	19	....	....	....	....
Russian Rose (*Rosa rugosa*)	19	....	....	....	....
Dock (*Rumex altissimus*)	19	....	....	....	....
Charlock (*Brassica sinapistrum*)	19	....	....	....	....
Wild Black Cherry (*Prunus serotina*)	20	76	50	....	....
Hawthorn (*Cratægus punctata*)	21	76	58	....	....
Average for third week	15-21	76. 9	56. 5	66. 7	....
Wild Phlox (*Phlox pilosa*)	22	83	59	....	....
Jersey Tea (*Ceanothus ovatus*)	22	....	....	....	....
Fleabane (*Erigeron Philadelphicus*)	23	77	63	....	....
Wild Olive (*Eleagnus angustifolius*)	23	....	....	....	....
Black Raspberry (*Rubus occidentalis*)	23	....	....	....	....
Dewberry (*Rubus Canadensis*)	23	....	....	....	....
False Indigo (*Baptisia leucophaea*)	23	....	....	....	....
Clammy Locust (*Robinia viscosa*)	24	79	55	....	....
Hedge Mustard (*Sisymbrium altissimum*)	24	....	....	....	....
Pennsylvania Anemone (*Anemone Pennsylvanica*)	24	....	....	....	....
	25	86	60	....	....
Meadow Foxtail (*Alopecurus pratensis*)	26	75	59	....	....
Swamp Saxifrage (*Saxifraga Pennsylvanica*)	26	....	....	....	....
Black Snakeroot (*Sanicula Marilandica*)	27	74	57	....	....
Alum Root (*Heuchera hispida*)	27	....	....	....	....
Sweet Cicily (*Osmorrhiza brevistylis*)	27	....	....	....	....
Ninebark (*Physocarpus opulifolia*)	28	82	57	....	....
Average for fourth week	21-28	79 5	58. 5	69. 5	....
	29	75	60	....	....
	30	61	44	....	....
	31	51	46	....	....
Average for fifth week	29 31	62. 3	50	56. 1	....
Average for the month	1-31	71. 3	52. 3	62. 3	9. 46
June.					
Wild Grape (*Vitis riparia*)	1	55	48	....	....
Trumpet Honeysuckle (*Lonicera sempervirens*)	2	66	54	....	....
Honeysuckle (*Lonicera Sullivantii*)	2	....	....	....	....
Fleabane (*Erigeron strigosus*)	3	73	56	....	....
Cow Parsnip (*Heracleum lanatum*)	4	74	57	....	....
	....	55. 0	48 0	....	....
	....	66. 0	54. 0	....	....
	....	73. 0	56. 0	....	....
Bromegrass (*Bromus inermis*)	4	74. 0	57. 0	....	....
	5	73. 0	58. 0	....	....
	6	81. 0	56. 0	....	....
	7	83 0	61. 0	....	....
Average for first week	1- 7	72. 4	55. 7	64. 1	....

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RECORD FOR AMES, 1908—CONTINUED.

Months.	Days.	Degrees of Temperature. Max.	Min.	Mean.	Rainfall in inches.
June					
Northern Fox Grape (*Vitis Labrusca*)	8	79 0	57.0	....	....
Purple Meadow-rue (*Thalictrum purpurascens*)	8	79.0	57.0	....	....
Kinnikinic (*Cornus sericea*)	8	....	....	....	....
Cryptotaenia (*Cryptotænia Canadensis*)	8	....	....	....	....
Horse Gentian (*Triosetum perfoliatum*)	9	68 0	52.0	....	....
Wahoo (*Euonymus atropurpurea*)	10	62.0	48.0	....	....
Purple Coneflower (*Echinacea angustifolia*)	10	62.0	42 0	....	....
	12	68.0	37.0	....	....
	13	77 0	45.0	....	....
Catalpa (*Catalpa speciosa*)	14	82.0	55.0	....	....
Average for second week	1-14	71 0	48.0	59.5	....
	15	84.0	55 0	....	....
	16	79.0	70.0	....	....
	17	78.0	49.0	....	....
Hedge Nettle (*Stachys palustris*)	18	76.0	56.0	....	....
	19	76.0	58.0	....	....
Cone-flower (*Rudbeckia hirta*)	20	70.0	59.0	....	....
	21	68.0	57.0	....	....
Average for third week	15-21	75.0	56.0	66.0	....
	22	72.0	53.0	....	....
Philadelphian Lily (*Lilium Philadelphicum*)	23	74.0	50.0	....	....
	24	76.0	58.0	....	....
	25	75.0	59.0	....	....
	26	79 0	59.0	....	....
	27	82.0	55.0	....	....
White Sweet Clover (*Melilotus alba*)	28	85.0	63.0	....	....
Yellow Sweet Clover (*Melilotus officinalis*)	28	....	....	....	....
Bellflower (*Campanula Americana*)	28	....	....	....	....
	29	87.0	61.0	....	....
May Day Tree, fruit ripe (*Prunus Padus*)	30	90	62	....	....
Average for fourth week	22-30	80	57.7	68.8	....
Average for month	1-30	74.6	54.8	64.3	1.97
July.					
	1	90	71	....	....
Vervain (*Verbena stricta*)	2	85	71	....	....
	3	80	71	....	....
	4	75	61	....	....
	5	83	55	....	....
	6	87	59	....	....
Sow Thistle (*Sonchus oleraceus*)	7	91	67	....	....
Prickly Lettuce (*Lactuca Scariola*)	7	....	....	....	....
Average for first week	1-7	84.6	65	74.8	....
Tick Trefoil (*Desmodium Canadense*)	8	89	66	....	....
Common Milkweed (*Asclepias Cornuti*)	9	93	72	....	....
Lepachys (*Lepachys pinnata*)	9	....	....	....	....
Wild Lily (*Lilium Canadensis*)	10	89	71	....	....
Milk Vetch (*Astragalus Canadensis*)	10	....	....	....	....
Culver's Root (*Veronica Virginica*)	10	....	....	....	....
Pilea (*Pilea pumila*)	10	....	....	....	....
	11	82	65	....	....
	12	78	60	....	....
	13	77	55	....	....
	14	86	54	....	....
Average for second week	8-14	85	63.3	74.1	....
Average for third week	15-21	83.3	61.8	72.5	....
Average for fourth week	22-28	87 7	63	75.3	....
Average for fifth week	29-31	75.6	56	65.3	....
Average for month	1-31	83.2	60.8	72.4	4.77

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RECORD FOR AMES, 1908—CONTINUED.

Months.	Days.	Degrees of Temperature. Max.	Min.	Mean.	Rainfall in inches.
August.					
Virgins Bower (*Clematis Virginiana*)	1	....	....	....	....
Average for first week	1-7	80.7	62	71.3	....
Goldenrod (*Solidago rigida*)	8	78	60	....	....
Iron weed (*Vernonia fasciculata*)	9	78	58	....	....
Goldenrod (*Solidago graminifolia*)	10	78	56	....	....
Hemp (*Cannabis sativa*)	10	....	....	....	....
Indian Tobacco (*Lobelia inflata*)	10	....	....	....	....
Bush Clover (*Lespedeza capitata*)	10	....	....	....	....
Broad-leaved Goldenrod (*Solidago latifolia*)	11	69	53	....	....
Mad-dog Skull cap (*Scutellaria lateriflora*)	12	70	51	....	....
Zig-zag Goldenrod (*Solidago flexicaulis*)	12	....	....	....	....
Rice Cut-grass (*Leersia oryzoides*)	12	....	....	....	....
Great Rag-weed (*Ambrosia trifida*)	12	....	....	....	....
Frank's Eragrostis (*Eragrostis Frankini*)	12	....	....	....	....
Strong Scented Eragrostis (*Eragrostis major*)	12	....	....	....	....
	13	71	56	....	....
	14	76	63	....	....
Average for second week	8-14	73.6	56	64.8	....
Cardinal Flower (*Lobelia cardinalis*) (8-18)	1	....	....	....	....
Average for third week	15-21	82.4	59.3	70	....
Dalea (*Dalea alopecuroides*) (8-28)	....	....	....	....	....
Great Lobelia (*Lobelia syphilitica*) (8-28)	....	....	....	....	....
Average for fourth week	21-28	81.1	64.5	72.8	....
Average for fifth week	29-31	69	52.9	60.9	....
Average for the month	1-31	77.3	58.9	67.9	3.7
Burdock (*Arctium Lappa*) (9-1)	....	....	....	....	....
Average for first week	1- 7	77.4	57.3	67.3	....
Gentian (*Gentiana quinquefolia*) (9-10)	....	....	....	....	....
Average for second week	8-14	71	50.4	60.7	....
Closed Gentian (*Gentiana Andrewsii*) (9-15)	15	....	....	....	....
Average for first two weeks	1-14	74.2	53.8	64	.85

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LEDGES, BOONE COUNTY.

Wake-robin (*Trillium nivale*)	March	17
Bellflower (*Campanula Americana*)	June	28
Tick-trefoil (*Desmodium Canadense*)	July	1
Mint (*Mentha Canadensis*)	"	1
Milkwort (*Polygala sanguinea*)	"	2
Horsemint (*Monarda fistulosa*)	"	2
Smartweed (*Polygonum Pennsylvanicum*)	"	4
Hartwright's Smartweed (*Polygonum Hartwrighti*)	"	5
Button Snakeroot (*Eryngium yuccaefolium*)	"	12
Culver's root (*Veronica Virginica*)	"	15
Wild Sunflower (*Helianthus rigidus*)	"	18
Pale-leaved Wood Sunflower (*Helianthus Strumosus*)	"	18
Large Button Snakeroot (*Liatris Scarrosa*)	"	18
Saw-tooth Sunflower (*Helianthus grosse-serratus*)	"	18
Rattlebox (*Crotalaria sagittalis*)	"	18
Missouri Goldenrod (*Solidago Missouriensis*)	"	18
Cup-plant (*Silphium perfoliatum*)	"	20
Elder (*Sambucus Canadensis*)	"	20
Rudbeckia (*Rudbeckia lacinitata*)	"	20
Marsh Muhlenbergia (*Muhlenbergia glomerata*)	"	20
Monkey-flower (*Mimulus ringens*)	"	20
Tickseed (*Coreopsis palmata*)	"	20
Marsh Cress (*Nasturtium palustre*)	"	24
Field Thistle (*Cnicus lanceolatus*)	"	24
St John's Wort (*Hypericum maculatum*)	"	25

CARROLL.

Green'sh Fringed Orchis (*Habenaria leucophaea*)	July	2

LEDYARD.

Bullrush (*Scirpus lacustris*)	June	10
Larkspur (*Delphinium azureum*)	"	18
Cow Parsnip (*Heracleum lanatum*)	"	18
Koeleria (*Koeleria cristata*)	"	18
Indian Plantain (*Cacalia tuberosa*)	"	20
Water-hemlock (*Cicuta maculata*)	"	20
Ox-eye (*Heliopsis scabra*)	"	20
Water-lily (*Nymphaea tuberosa*)	"	20
Blue flag (*Iris versicolor*)	"	20

THE PRESIDENT: We have this paper before us. We would like to have it discussed. We have with us the professor of horticulture from Wisconsin, Professor Sandsten; we would like to hear from him.

PROFESSOR SANDSTEN: I am sure that all of us enjoyed Miss King's paper. It covers a subject that has not been studied sufficiently by horticulturists. For the last seven or eight years our experiment station has collected data through the blooming time of our fruit trees and has kept a record of the temperature every day, and about two weeks ago I gave the work over to one student to tabulate it. We find there is a close connection between the temperature, or sum total of the temperature with the season. We find some seasons our fruit trees blossom earlier than others. We find it is due to the amount of

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sunshine, and that if we have a favorable spring with high temperature and sunshine we have the blooming period earlier.

There is one point, I think, Miss King did not mention. It is not always the phenological condition that determines the position of a flowering time. You take our tamerack in the northern woods; people will say that it is native in the swamps; yet that is not strictly true, because it does better on the highland. There is an element of competition in nature that also determines the flowering time. If you remove the competition you would find that the plants would perhaps assume different habitat. So there is the struggle for existence that determines the position of plants. You will notice in the spring time many plants that flower early; that after the flowering time they actually disappear; the leaves drop and other species take their place. The last in the fall is the Golden-rod. From a mechanical point of view, it came into existence perhaps later than any other, and it fills a space unoccupied by the others.

As I said before, we fruit growers, in general, do not pay enough attention to these things; we do not study the natural conditions that surround plant growth. The question of cultivation, pruning, spraying and general horticulture are all beginning to be familiar to every one of us; it is about time we begin, in these other matters, to bring new life into horticulture.

THE PRESIDENT: The next paper is entitled "Roots and Tubers as Food," by Miss Rachel L. Mosier.

THE VALUE OF ROOTS AND TUBERS AS FOODS.

BY MISS RACHEL L. MOSIER, AMES.

As the grain of cereals is the storehouse for its nutriment so roots and tubers are the storehouse for the nourishment of the plant. But the general composition of roots and tubers shows this nutrient material to be chiefly carbohydrates or starch and sugar. Some proteid or nitrogenous material is present and mineral matter, mainly as salts of potash, gives an additional value to them.

The roots and tubers used for food are the potato, yam, Jerusalem artichoke, carrot, onion, radish, beet, parsnip and turnip. Starches from roots are prepared as tapioca and sage.

The potato is the typical tuber. Analysis shows it to be 75 per cent water, 19 per cent carbohydrate and 9 per cent potash. The predominance of carbohydrate proves it to be too poor in nitrogenous material to support

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life alone. The Irishman who attempts to use the potato as his chief food has to assimilate ten to eleven pounds of material daily, while he would need only one-sixth that amount of bread.

The juice of the potato has a high antiscorbutic value, so that where potatoes are used freely scurvy is unknown. The young potato with unformed starch and immature tissue is unwholesome. It contains more proteid but is much more difficult of digestion than a ripe, mealy potato. Diseased potatoes are extremely indigestible and should never be used as food.

Potatoes a year old which have lain in a cellar and sprouted are considered dangerous. Solanin poisoning being apt to result from their use.

It is calculated that more food can be obtained per acre by a crop of potatoes than by any other British food plant. In Germany it is the chief source of starch. And there glucose is manufactured from it on a large scale. Glucose is generally thought to be injurious when made from starch. This is an erroneous idea. Cane sugar when boiled for a length of time is converted into glucose and this is the last stage in the digestion of all sugars. The only difference there is between cane sugar and glucose is that glucose has only about one-third the sweetening power of cane sugar.

Three-fourths of the crude fiber of a potato is found to be digested and practically all of this is absorbed. Its popularity is due to its agreeable flavor, keeping qualities and cheapness. Used with proteids we have a most excellent diet.

The yam is a tuber grown in the tropics. It has value similar to that of the sweet potato.

The sweet potato is richer in carbohydrates than the white potato, having 24 per cent, of which 9 per cent is sugar and 15 per cent starch. Next to maize it is the chief food of the poorer classes of the United States. It is also used in France and Spain, though seldom in England. The one objection of the bulk necessary for the proper amount of nutriment still remains.

The Jerusalem artichoke is a tuber of the same species as the sunflower. It is used chiefly in soups. As it has only 14 per cent of starch and 2 per cent of sugar, it does not rank high as a food.

The carrot has only 8 per cent of carbohydrates. The center portion of carrots is quite woody. Cultivation aims to increase the outer portion. Here, too, is a root of little food value. The onion and radish rank as condiments rather than as foods.

The turnip has only 5 per cent of carbohydrates and none of starch. "Pectose" bodies make up its chief bulk. This solid vegetable contains more water than does milk. Strange as it may seem the white turnip which we use does not contain as much nutriment as the coarser "swede" we feed to cattle.

The beet is a valuable source of food. The carbohydrates of the beet root is mostly in the form of sugar, very little starch being present. The problem of selection has done much for the beet. A few years ago 5 per cent of cane sugar was considered a fair per cent to find, but now beets yield from 18 to 20 per cent. Beets are an especially valuable source of sugar because they can be stored without the loss of sugar, that is no change occurs in its sugar.

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The growing of the sugar beet has become a large industry in our middle west states. A larger per cent of our sugar is beet sugar than we realize. It is as good as cane sugar if the purification is carried on properly.

Tapioca is a commercial product obtained from the roots of South American plants. The product is prepared by grating the roots of the plants and allowing the starch to settle out. It is then washed and dried at a high temperature. Tapioca is to be considered a special form of starch.

Arrowroot is a similar product obtained from the root of a West Indian plant. Both these foods are to be avoided in cases where the work of the stomach is to be lightened, for they remain from two and one half to three hours in the stomach. They are almost completely absorbed in the intestines. Their nutritive value is not a balanced one. They should be used with milk and eggs, as these will furnish the needed proteid.

The value of a food depends upon the constituents, and upon its absorption in the body and its digestibility. A perfect food has one part of proteid to four and two-tenths of carbohydrate. Roots and tubers fall short of this test but they rank high as esculents.

THE PRESIDENT: Ladies and gentlemen, this paper is before you.

MR. HINDS: Does the codfish ball and the potato make a balanced ration?

MISS MOSIER: I am glad this question was asked. If we cook it properly it is a good food. We have there a balanced ration, because the fish contains the protein, and potato the starches; I think it makes a very good food.

THE PRESIDENT: The next paper is entitled, "An Experiment with Native Iowa Flora in the Home Garden", by Miss Harriett S. Kellogg.

AN EXPERIMENT WITH NATIVE IOWA FLORA IN THE HOME GARDEN.

BY MISS HARRIETTE S. KELLOGG, AMES.

At no time does the voice of Nature speak to us more clearly than when we wander amid "God's first temples;" the groves. With the waiving foliage above and the carpet of ferns and mosses and delicate hued floral beauties beneath, we seem very near to the heart of creation. But our avocations call many of us far away from these more natural surroundings, and, amid the more artificial life of the town, we are prone to forget the splendor of wood and field. Yet it is possible to bring a bit of woodland glory to our very doors and thus keep our souls attuned to the harmony and beneficence of the deeper teachings of Nature. Although we may not often enjoy the delicate blooms in their native setting, we may train them to flower for us in the more prosaic town garden.

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In the present article, the writer has in mind merely to record one such attempt made by a lover of woodland flora to transplant favorite species to the home garden, and, while discussing her experience covering a period of thirty years, it may be interesting to note certain results of ecological importance produced by the adaptation of the different plants to their new environment.

The ground to which the native plants were removed was devoid of shrubbery save for a few fruit trees along the eastern side. It had a southern exposure with sufficient slope to insure drainage, while the trees afforded a shade nearly as dense as that in the woods from which the majority of the transplanted specimens were obtained. In the southeast corner a small boulder offered an inviting place for ferns and mosses.

In removing plants from the neighboring groves, especial care was taken to also remove with them an ample amount of soil in order that the demands upon the plants' recuperative powers might be taxed as lightly as possible. This care in bringing large clumps of earth more than repaid the gardener for her trouble since by this means other seeds and roots were unwittingly brought to the little garden and in due time surprised the worker with their unexpected appearance.

The first plant experimented with was the liverleaf (*Hepatica triloba.*)

> Which puts forth her sister blooms
> of faintest blue."

and although the first root was brought to the garden more than thirty years ago, not a season has since passed that the dainty blue and pink stars have not been found blooming cheerily beneath their covering of leaves, while the earth is yet shrouded in its somber winter mantle.

Lungwort (*Mertensia Virginica*) blue phlox (*P. divaricata)*, and Greek valerian (*Polemonium reptans*) were the next inhabitants of the plat, and have proved the most adaptable of all the varieties transplanted. They have bloomed and multiplied until in the spring time the corner is a mass of blue. Anemones, the

> "Windflowers which sway
> Against the throbbing heart of May,"

meadow rues (*Thalictrum dioicum*), blood roots (*Sanguinaria Canadensis*), whose sanguinary names belie their snowy blossoms, and spring beauties (*Claytonia Virginica*) have merely held their own; that is to say they blossom each year without fail, but do not increase in number, new generations of plants, not more than supplying the places of those disappearing. The buttercup (*Ranunculus septentrionalis*) and yellow violet (*V. pubescens*).

> "Whose modest bell
> Peeps from the last year's leaves below."

furnish a touch of gold to the color scheme of the garden.

The blue violet (*V. palmata cucullata*) has become thoroughly established in its new home and often rewards the gardener with a second crop of blossoms, several flowers having been picked this year as late as November 16th, rivaling the English sweet violet in color and fragrance.

In another part of the yard, at the roots of an old lilac bush, where there was an abundance of moisture, ferns and kindred plants were set out and at

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least six species have been successfully transplanted. Maiden hair (*Adiantum pedatum*), the dainty woodsia obtusa, polypodiums from North Carolina as well as from Iowa, cystopteris, the walking fern (*Camptosorus rhyzophyllis*) and one species of asplenium have thriven well and vie with the imported greenhouse varieties in beauty. Near these, a botrychium has also become established.

While making the garden it has been a pleasure, oft repeated to find unexpected plants which have been inadvertently brought as seeds or as roots with other plants. Among these were Jack-in-the-pulpit (*Arisaema triphyllum*), whose purple stains the old legend tells us were drops of blood caught in the cup as they fell from the Savior's body at the Crucifixion, true and false Solomon's seal (*Polygonatum biflorum* and *Smilacina racemosa*), waterleaf (*Hydrophyllum maculatum*), desmodium, bedstraw (*Galium trifidum*), mosses and liverworts. It might also be mentioned that a honey locust (*Gleditschia triacanthos*), at present twelve feet tall and a flourishing elderberry bush (*Sambucus Canadensis*) have been acquired in the same manner.

The "downy stemmed anemone" or pasque flower (*A. patens Nuttalliana*) and the dainty viola blanda of Minnesota and trailing arbutus (*Epigaea repens*) from North Carolina, New York and Michigan have failed to adapt themselves to the foreign environment, though the pasque flower is native in Iowa: however, I have not known an instance of its being so successully transplanted that it has bloomed a second summer. On the other hand, the tick trefoil (*Desmodium nudiflorum*) has almost reached the status of an obnoxious weed. As the fruit trees died and the fad for removing fences reached the town, new quarters became necessary for the wild flowers, and specimens of each kind were successfully removed to another part of the yard.

It may be of interest to note several results of ecological importance which have arisen from this experiment covering a period of thirty years. First, the plants seem to have adapted themselves to an environment somewhat different from that of their native haunts in that they have been removed from rather dense woods to somewhat open ground. Again, they have been tenacious of life; drouth, killing frosts, alternations of winter temperature, that have proved destructive to small fruits, have left the more tender plants unharmed. Again they have not changed at all in appearance, but, with the exception of lungwort, blue phlox and Greek valerian, have been less prolific than in their native woods. Even the columbine, with its wonderful contrivance for scattering seeds, has not increased by a single plant. Not even the most thoroughly established of them all has multiplied as rapidly as a single vine of the common cultivated morning glory would have done in the same time. It has been very evident throughout the experiment, that plants do not establish themselves quickly; the order of establishment of plants placed in the garden, during the same year seems to have been mertensia, blue phlox, Greek valerian, blue violet and hepatica.

Perhaps the most important of all results has been, that, while the experiment has been undertaken with no thought of scientific interest, nevertheless, as the woods have receded farther and farther from the town, in this little garden of a few square feet, are being preserved about forty species of our native Iowa flora, several of which have already become extinct

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in the country round about. A second result, not ecological, is that the children of the vicinity are thus becoming familiar with native flora that might otherwise have remained a sealed book to them as the neighboring groves have disappeared one by one. And last of all, from the morning on which the dainty hepatica first lifts its head from amid the brown covering of leaves, until the last flower of spring has formed its seed, there is a succession of bloom and fragrance and miracles of growth and development that bring the soul of the gardener into the closest communion with nature.

Below is appended a list of native Iowa plants which have been successfully grown in the garden described in this article. No attempt was made to introduce summer or autumn flowering species, the limits of the garden necessarily forbidding more extensive operations:

Liverleaf (*Hepatica triloba*).
Wood anemone (*A. nemorosa*).
Rue anemone (*A. thalictroides*).
Meadow rue (*Thalictrum dioicum*).
Columbine (*Aquilegia Canadensis*).
Larkspur (*Delphinium azureum*).
Climbing Clematis (*C. Virginiana*).
Buttercup (*Ranunculus septentronalis*).
Bloodroot (*Sanguinaria Canadensis*).
Blue phlox (*P. divaricata*)
Greek valerian (*Polemonium reptans*).
Bellwort (*Uvularia grandiflora*).
Cranesbill (*Geranium maculatum*).
Sorrel (*Oxalis stricta*).
Man rake (*Podophyllum peltatum*).
Violets (*V. palmata, V, pubescens and V. pedata*).
Jack-in-the-pulpit (*Arisaema triphyllum*).
Asters, blue and white.
Solomon's seal (*Polygonatum biflorum*).
False Solomon's seal (*Smilacina stellata*).
Blue-eyed grass (*Sisyrinchium angustifolium*).
Star grass (*Hypoxis erecta*).
Spiderwort (*Tradescantia Virginica*).
Bedstraw (*Galium trifidum*).
Tick trefoil (*Desmodium nudiflorum*).
Five finger (*Potentilla Canadensis*).
Waterleaf (*Hydrophyllum macrophyllum*).
——— (*Ellisia nyctelia*).
Wild strawberry (*Fragatia vesca*).
Lung ort (*Mertensia Virginica*).
Squirrel corn (*Dicentra cucullaria*).
Ferns (*Adiantum pedatum*).
(*Camptosorus rhyzophyllis*).
(*Polypodium vulgare*).
(*Woodsia obtusa*),
(*Cystopteris*).
(*Asplenium*).
(*Botrychium*).

THE PRESIDENT: The next paper is entitled, "The Dietetic Value of the Legumes", by Mrs. Mary Van Zile.

THE DIETETIC VALUE OF THE LEGUMES.

BY MRS. MARY VAN ZILE, AMES.

The body of man may be regarded as a machine for the transformation of energy. It does not create energy, only transforms it. The energy must be supplied to it, as well as the necessary heat to carry on the transformation, and besides this the natural waste of the machine must be repaired. These requirements of this machine—the body—are met by the food that man consumes. Food then has a two-fold function. First, that of building up and repairing the waste in the body, and second, the supplying of the heat and energy necessary to furnish activity to it. Such being the functions of food the question naturally arises, How are we to judge the relative value of the different foods? To what standard must a food attain before it can be accepted as a good food? The answer comes that before a food can be said to be good it must meet the requirements of a chemical test, a physiological test, and an economical test. A word as to what each includes. First consider the chemical test. The body demands a supply of carbon, hydrogen, oxygen and nitrogen and our food is the source of

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these elements. They are not taken directly as carbon, hydrogen, oxygen and nitrogen, but as compounds made from these elements. These compounds are classified as proteids, carbohydrates, fats, mineral salts and water and together are called the "Proximate Principles of Food." Broadly speaking proteids repair waste and form new tissue, while carbohydrates and fats supply the required heat and energy. These proximate principles are spoken of as the nutritive constituents of food, and to meet the requirements of the chemical test a food must contain them in the proper proportions.

The physiological test must also be applied. This shows us how a food acts in the stomach and intestines. Also to what extent it is absorbed.

Further the economical test must not be forgotten, for unless the food in question can be supplied at a reasonable cost it does not come up to the desired standard.

In studying foods from these different standpoints it will not take long to convince one that it is very hard to find a food that will entirely meet the requirements. It is therefore the object of students in domestic science to study the different foods from these different standpoints.

In this paper, we will consider one class of foods—the legumes—and see how nearly they meet the necessary requirements of a perfect food. The word legume as commonly used, applies to the plants that bear pods containing one or more seeds. Among the more common members of the family are the various kinds of peas and beans, but the peanut also belongs to this family.

Leaving out the peanut for the present from our consideration we will consider the rest of the legumes as a class since they are very similar. We will first consider the question of nutrition. Which of the proximate principles are represented? By careful chemical analysis it has been determined that the legumes contain some of each of the proximate principles, that is they contain proteid, carbohydrate, fat, mineral salt and water. The chief proteid present is callad "legumin." Owing to its close resemblance to the proteid of milk it is often spoken of as vegetable casein. The amount of this legumin present is relatively large, and by virtue of the fact that the legumes contain so much nitrogen in the form of this proteid, legumin, they have been called the "poor man's beef." It is an established fact that the legumes contain as much nitrogenous matter as the best cuts of meat. This alone is enough to recommend them highly from a nutritive standpoint since nitrogen is of first importance in any dietary.

Vegetable foods in general are rich in starch which supply the required carbon but they contain comparatively little nitrogen. It is the presence of this nitrogen in the legumes that makes them so much more valuable than other vegetable foods.

The legumes also contain a good supply of carbohydrate and mineral salts but in fats they are somewhat deficient. This deficiency however is supplied when we cook beans and pork together, or add butter and cream to peas. If we were to judge alone from the chemical analysis we would give the legumes a very high place among foods, but since the value does not depend wholly upon the nutritive elements that are present in the food but also on the completeness with which the system utilizes it, we must inquire farther.

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A careful study experimentally has been made regarding the digestible matter in the form of cellulose. However careful preparation, does without question make them quite digestible. There is much experimental evidence that goes to show that if they are eaten in moderate quantities after being properly prepared no bad results will follow. They should always be cooked in soft water, because the legumin present in the legumes forms with the salts present in hard water insoluble compounds, the result being that the seed remains hard no matter how long it is boiled. If it is impossible to obtain soft water add soda to the hard water before using. This acts on the salts present in the water, and the lime is thrown down in the form of a precepitate. The dried legumes should be cooked a long time to properly soften the cellulose and also to develope the flavor that is desired. The pork and beans baked all night in the New England brick oven may be given as an example of properly cooked legumes, which cannot be said to be indigestible. It is true that people who lead sedentary lives cannot use them as a steady diet; but for people who lead active out door lives they can be used with impunity.

It now remains to consider the relative cost of the legumes. The fact that representatives of the family are found in all countries, together with the fact that they are easily cultivated makes their cost low in comparison with their value. Figures taken from a bulletin issued by the Department of Agriculture at Washington convinces one of the truth of the statement. The value of a food is established by the number of calories of heat it furnishes during metabolism. The figures refered to give the average number of calories derived from ten cents worth of dried legumes as 3440, while the number of calories from ten cents worth of the best cuts of meat furdished only 1040 calories. Ten cents worth of eggs when they were fifteen cents per dozen yielded 635 calories. Ten cents worth of milk at three cents per quart yielded 2170 calories, ten cents worth of potatoes at sixty cents a bushel yielded 3,000 calories, ten cents worth of bread yielded 4045 calories. These figures show that the dried legumes furnish for the same cost more energy than any of these foods except bread.

Peanuts differ enough from the other members of the legume family to make it necessary to consider them separately. The striking difference in their composition is the large amount of fat present. Often this is as high as 38 or 40 per cent. It is in the form of an oil which is extracted and sold as peanut oil. It is somewhat inferior to olive oil yet it has qualities that render it quite valuable, and in Europe where large quantities of the nuts are raised the extracting of this oil is quite an industry. In America the peanut crop is not larger than the demand of the confectioner, and as it is used at present it can hardly be said to be a food. Yet it is quite possible that the time will come when the peanut will be utilized largely for this purpose.

From our study of the legumes may we not draw these conclusions: First, from the standpoint of nutrition the legumes are not equaled by any other class of vegetables. Second that although somewhat defective in digestibility, this can be overcome largely by proper preparation. And third, that their cost is relatively low when compared with other foods.

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These facts show the importance of the legumes from a dietetic standpoint and go to prove that they may be profitably used to considerable extent when the income is limited.

THE PRESIDENT: The paper is before you for discussion. You bachelors who have to do your own cooking have an opportunity to discuss this subject.

MR. THOMPSON: I have been very much interested in this paper on legumes and also the paper preceding, on tubers. It is very gratifying to me to find that the ladies are studying chemistry to the extent I see they have been studying it. It is a step in the right direction, indeed, and I see they have put a great deal of study on these questions.

It is a fact that we have paid more attention to foods for animals in the past ten or thirty years than we have to the food of human beings. We are always talking about balanced rations for cattle, and very little is said about balanced rations for people. It is certainly a very practical line of investigation.

The sugar beet, I think was mentioned in Miss Mosier's paper. I think that she mentioned that the beet has been perfected from 5 per cent to 8 per cent in its sugar producing quality. We have records showing now as high as 25 per cent of sugar produced.

There are no sugar beet factories in Iowa, but I hope there will be; it will be a good thing for the stock; there will be a good many by-products that will supply food for the stock.

THE PRESIDENT: We have with us tonight, Miss Alice Merritt who will read a paper on "The Value of Fruit in the Diet."

THE VALUE OF FRUIT IN THE DIET.

BY ALICE MERRITT, DIRECTOR DOMESTIC ECONOMY, IOWA STATE COLLEGE, AMES.

It is a fact much to be regretted that fruit does not occupy the place which it should on our table. The many popular errors abroad concerning its indigestibility are perhaps partially responsible for its sparing use, and the lack of knowledge of its great value in so many diseased conditions is also responsible for the fact that it occupies so small a place in the bill of fare of civilized nations. In the primitive state of man, fruit formed one of the principle articles of diet, as it still does in some of the tropical countries where many of the natives subsist almost entirely upon the fruit of the date,

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banana, and similar tropical foods. Most of the fruits, however, do not contain enough of the nutritive constituents to form the staple article of diet. They are rather to be used to supplement the other food. This leads to a general classification of fruit according to its composition:

1. Flavor fruits, or those in which very little nutriment is found. This fruit is valued chiefly for its flavor and the acid which it contains.

2. Food fruits, such as the banana, figs, raisins, dates, etc.

The former class contains a large amount of water (85 per cent to 90 per cent of whole fruit), the acids and flavors. The water is especially valuable in conveying large amounts to the system, thus relieving thirst as well as aiding the system in throwing off certain diseases. To the acids found in fruit, much of their value in disease is due. Bacteriologists have proven beyond a doubt that pathogenic germs are killed by citric acid. The juice of a lemon is as deadly to germ life as corrosive sublimate, formaldehyde, or any other disinfectant. So powerful a germicide is it, that if the juice of a lemon be squeezed in a glass of water and left standing a short time, the water will be disinfected. This fact is worth knowing, for when it is impossible to get either boiled or filtered water, the juice of a lemon purifies it perfectly. The same effect is produced by the acids in some of the other fruits. This fact has given fruit a very high rank in the diet of certain diseases. German physicians have recognized this, hence their extended use of fruit juices in fevers, and similar diseases. Before this fact was well known, fever patients were fed of beef tea, bouillon, etc. Now this diet is rarely given for it is a medium for bacterial life and the minute destroyers thrive and increase alarmingly in it. On the other hand fruit juices destroy bacterial life and prevent the growth of the germs of disease. The juice of oranges, grapes, raspberries, blackberries, currants or cranberries, may be added to water and used as a beverage in fevers. Used in this way they increase the amount of water the patient is enabled to drink, by giving a distinct and agreeable flavor, as well as killing germs and eliminating the poisons in the system by a slight diuretic action. Fruit juices used in the same way are highly beneficial in kidney diseases. The valuable results of a fruit diet in dyspepsia and indigestion are partially due to the same fact that the noxious germs in the alimentary canal do not thrive in fruit juice.

Fruits are the natural correctives of disordered digestion, and to do the best and most effective work should be eaten on an empty stomach or simply with bread. It does not seem to effect the desired results when taken at the close of a hearty meal. The best time to eat fruit is in the morning and it should find its appearance on our breakfast table more than it does. In the morning the secretions of the digestive tract seem to be in an acid state and fruit corrects this. It might be supposed that since fruit contains acid in itself it would only increase the acid in the system, but this is not true. The acids are in the form of organic acids, and are readily converted in the system into alkaline carbonates which are free to neutralize the acids and thus counteract acidity. They are therefore very beneficial in diseases resulting from over-acidity in the system. Acids also improve the quality of the blood by breaking up some of the compounds of waste substances which have been formed and thus increase the secretions. Fruits are especially good for persons of sedentary habits whose livers are sluggish. The acids serving to eliminate from the body the noxious matters which if retained

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would make the brain heavy and dull or bring about jaundice, skin eruptions, etc.

Fruit is also valuable because of its laxative properties. This property is due to indigestible substances, cellulose, seeds, etc. When eaten for this purpose, the fruit should be eaten freely, fresh if possible and as soon after ripening as it can be had. As a general thing canned and dried fruit is not considered as valuable as fresh, although there are exceptions in which the cellulose is greatly softened by cooking. The modern improvements in means of rapid transportation and method of culture make some variety of fresh fruit possible in almost every climate in all seasons.

The odor and flavors of fruit are due to small quantities of ethereal bodies, some of which form the basis of different fruit flavorings and essences. Although these have no nutritive value, they are not to be despised as stimulants to the appetite and aids to digestion.

As far back as the tenth century medical authorities became very enthusiastic in their writings over remarkable curative properties of different fruits. In more modern times this has been revived and nearly every one has heard of the "grape cure," the apple, peach or strawberry cure. One writer is said to have recommended in special cases eating twenty pounds of strawberries a day. The same writer also cites cases in which maniacs have gained their reason by the exclusive use of cherries. These instances savor of the ridiculous, but there is no doubt that the so-called grape cure for digestion and other evils has resulted in great good to persons trying it. The fruit should be of good quality, if it is not, and the grapes are sour and watery, the patient may be harmed rather than benefited. Apples are said to contain more phosphorus than any other fruit, or vegetable, and it is claimed that this makes them specially adapted to renewing the nervous matter of the brain and spinal cord. Perhaps for the same reason, rudely understood, the old Scandinavian traditions represent the apple as the food of the gods, who, when they felt themselves growing feeble and infirm resorted to this fruit for renewing their powers of mind and body.

Of the food fruits, a good example is the banana. Aside from the date, fig and raisin it is the most nourishing of all the fruits. In its fresh state, it contains considerable carbohydrate, most of which is in the form of sugar, and some proteid. It is, however, too bulky to serve as the main constituent of a healthy diet. It is also dried in the sun and sprinkled with sugar, in which form it has recently been imported. Unripe bananas are also dried and used to produce banana meal or flour. This flour is very easy of digestion, and is used to make a sort of bread, gruel, etc. Another advantage of the banana is the cheapness with which it may be produced. It has been calculated that bananas grown in a suitable soil and properly cultivated are capable of producing more food to the acre than any other plant. When well ripened the banana is very easily digested. Many of the ill effects felt by people in eating this fruit is due to the fact that the fruit is not properly ripened. The dry, green bananas often found in the stores are unfit to eat. It is evident that we possess in the banana a source of cheap nourishment which may one day be of great importance.

Dried fruits, as dates, figs, and raisins, surpass even the banana in nutritive value.

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Thus from our study of fruit we find that it should not be regarded as a luxury but as a valuable addition to the diet. If more fruit and less animal food were eaten; the body would be kept in a more healthy state, and our doctor bills would be much less. Instead of resorting to the use of medicine for correcting disease, let us whenever possible, use the methods which nature has provided for her children.

THE PRESIDENT: This very valuable paper is now before you for discussion.

PROFESSOR SANDSTEN: I did not intend to talk again, but it occurred to me, as I was listening to the paper, that in traveling around over the states, I have always noticed that horticulturists or fruit growers in general are a lean and hungry-looking people; that is to say, they do not put on much flesh. Another thing; they seem to live to a good old age. I believe it is due to the amount of fruit they eat. I have found only one fleshy man who is a horticulturist and who lived in Maryland and had a peach orchard of about 300 acres; I said to him one day, why it is that you are so fleshy? I never saw a man like you. He says, I will tell you; I don't eat peaches.

CAPTAIN WATROUS: I know that we have been greatly entertained and I believe we have been greatly benefited. I think the least that we can do to show our appreciation of the work of these ladies, is to make them honorary members, and I therefore move you, Mr. President, that they be made honorary members of this society.

MR. WILSON: I desire to second that motion, and in doing so, I wish to say, that I believe I express the unanimous voice of this society, that we have not only been honored, but we have been instructed by the presence of these ladies, as well as by these papers. I am a very good listener; my modesty often prevents me from talking, but I have been very much interested in these papers tonight. The lady who read the paper on the Native Flora mentioned one flower that carries me back to last summer when I was in the Rocky Mountains—the columbine. It occurs there is great profusion. We found this magnificent flower all over the hills there, from 11,500 to 13,000 feet above the sea level. I believe a friend of mine and myself counted twenty-seven distinct species of flowers. How they would come up there in a few days after the snow had melted away, was a complete surprise to us all; it shows how completely nature does her work. Where it would take weeks and months in this climate,

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there the flowers spring up in a few days. When this lady mentioned these columbines, I could not help but speak of the beauty of these flowers.

We feel very much like congratulating ourselves on your presence, and for the information you have imparted to us. This cannot be commended too highly; the presence and the services of these ladies can not be commended too highly.

(By a unanimous vote Miss Charlotte M. King, Miss Harriette S. Kellogg, Miss Rachel L. Mosier, Mrs. Mary Van Zile and Miss Alice Merritt were made honorary members of the society.)

MR. REEVES: While the vote was taken under a somewhat light spirit, I think it was in a different spirit that these papers were received. I think they were pleasing and instructive. They were certainly some of the most instructive papers we have had during our present session. We are glad to get an acquaintance with what they are doing at the College along these lines. Many of the women of our State would like to get into the scientific secrets pertaining to the matters of cooking; they have no means of reaching that question, except by coming in touch with the work that is being done at the College at Ames. I think, if our volume for next year contained nothing but these papers, it would be well worth sending out to our members; well worth their study.

MR. NUTTER, of Minneapolis: I must confess that any reference to the food question is not entirely uninstructive. But the paper that treated of wild flowers and the garden, of course, is the one that appeals to me especially, and it is an interesting fact, that in these days of nature study, the wild flowers of the swamps and woods are attracting more attention than they used to. Those who received catalogues received long lists of native plants, because through the efforts of collectors, in some places, rare specimens are being almost totally destroyed; that is, of course, to be regretted. We do not recognize, many of us, what riches we have right around us. We know that in California and the Rocky Mountains there are sights to see that we have not seen; still we have riches here that can be appreciated.

I remember this fall I was going down through eastern Wisconsin, and all of a sudden we dashed by a swamp lined with little Marsh Cardinal flowers. That mass of flowers of brilliant color was a most beautiful sight. There are many pleasant surprises, haps and mishaps in the collection of flowers. I remem-

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ber a friend of mine who was engaged in fixing up a little place as a little bog garden. A few months ago we were out in the western part of the State, and as we were going along on the train, we saw a very large clump of lilies. He stopped at the next town, hired a livery rig, got a sack and spade, went out, and he did get a nice collection. But, in a day or so, he discovered he had gotten something he had not counted on. He had collected the poison ivy also, and by he time he paid the doctor bill, it became rather an expensive collection.

CAPTAIN WATROUS: Right here I want to relate something I have seen published this summer in connection with the poison ivy. You haven't it in a great many places. It is this, if you have reason to believe you have touched poison ivy, or are injured by it, you should wash the parts with gasoline. It is said that the emanation, or that which comes from the plant is of an oily nature, and if you wash it with water, you haven't removed it, but that gasoline dissolves it and no evil effects will follow. It is certainly worth knowing and worth trying. I might say something that has occurred to me—we sometimes get the blues and say, that the world does not go forward, in that things are a great deal worse than in the olden times. I thought, as I sat here, there had been a great change for the better in the direction our studies are taking in our schools, like that at Ames. When I was a boy, more than fifty years ago, I went away from the farm and went to a college, and there was almost no attention paid to the things that are given the most attention at Ames. At that time the basis of our studies was Latin and Greek, and the brightest students that were there, the ones we gave most honor to, were those who studied Greek and Latin. I have known students, however, who were well versed in Greek and Latin who would make awkward blunders in the use of their own mother tongue. To the things that went on about us, plant life, botany, climatology and physiology, we scarcely gave any attention.

Down at Boston, about a month ago, the very finest address delivered before the Pomological Society, was an address by Dr. Bailey, Dean of the School of Agriculture, Cornell University, New York. It was on the "Relation of the School to the Children." He took the broad ground, that the mind may be broadened and the intellect disciplined just as much by a study of the things that are next to us, things we see and feel, as by the study of Latin and Greek, or the languages of a people who

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lived two thousand years ago; who were practically strangers to the knowledge that goes to make our lives comfortable every day.

As to the matter of food and domestic economy--the Lord knows, we Americans need a great deal more of that sort of knowledge than we have. I have certainly been very much interested and pleased, and I hope we have all been made better.

MR. WILSON: I am not quite satisfied with what I said awhile ago. I do not wish to retract anything; I wish to add a little to it. This question of preparing foods is to me one of the most important that has been discussed before this society. You know our distinguished friend from Wisconsin said, as a rule horticulturists, or fruit growers were a lean lot of men; that applies to your humble servant. I appreciate the force of the Professor's remarks. I have traveled a great deal about the country. There is no question that interests me more than the poorly prepared foods I eat; it is astonishing! I wish our people could wake up to the dangers of poorly prepared food. You may take the most handsome man in appearance and you fill his stomach full of half-cooked bread and he is miserable; he makes everybody miserable around him, by his looks and actions. There is no department connected with the institution at Ames that seems to me of more value, than that of Domestic Economy.

Now, I have been fortunate enough to have a wife who is a good cook. When I go away, she says I am a grumbler and growler; she has been with me on trips. I am not. I can eat anything digestible, but I cannot eat half-cooked cereals; they are unhealthy and cause more misery than anybody is aware of. I could hardly be quiet, Mr. President, without expressing myself; we like to feel well; as well as anybody else. I always feel well when I have foods which are well prepared.

MR. FORSTER: When I heard Mr. Wilson talk about visiting forty counties in the State, I felt somewhat slighted, but now I am glad he was not in our part of the country.

I want to say a few words, to express the feeling of my heart tonight. I have enjoyed these papers very much. We talk about the things around us—I want to say, I have been surprised this summer—I have a daughter attending high school in town. The teachers there would appoint her as a committee to go out home into the woodlands, on the hills down there—just perfectly covered with flowers—I think nothing about them; I just see them and they are nice. She gathers up a collection of the dif-

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ferent varieties and takes them to our high school. I asked her what they were doing with these flowers. She said they analyzed them. I am sorry to say, I don't know anything about that. I am glad our schools are taking up these things; they can tell us things we never dreamed of.

MR. FERRIS: I want to express my appreciation for the honor done us and the instruction given by these excellent papers. There is one lesson conveyed to us that none of the gentlemen preceding me have alluded to. These ladies have shown how much instruction may be conveyed in a short paper, and it admonishes us to stop writing fifteen or twenty pages to demonstrate some pet theory. These are truths that should be applied. We should take a lesson and condense the matter contained in our report. I have been thinking since hearing these papers on the values of different foods, about what I would do when I go home. I will tell my wife that if she will give me apples for breakfast; baked beans for dinner and codfish balls for supper, I will quit patronizing the druggist and discharge my family physician.

THE PRESIDENT: We have now come to the election of officers. I want the ladies to stay here and see how orderly we conduct these things.

The Chair appointed as tellers Mr. Welch of Shenandoah and Mr. Thompson of Perry.

Upon motion duly made and carried an informal ballot was taken for the election of President. After the result of the informal ballot was announced all members for whom votes were cast withdrew their names, and, upon motion, Mr. P. F. Kinne was unanimously chosen, and the Secretary directed to cast the ballot of the Association for Mr. Kinne.

On motion the Secretary was instructed to cast the ballot of the society for W. A. Burnap for Vice President.

Upon motion the President was instructed to cast the ballot of the society for Wesley Greene to succeed himself as Secretary of the society.

Upon motion the Secretary was instructed to cast the ballot of the society for Elmer M. Reeves to succeed himself as Treasurer of the society.

The following directors for their respective districts were chosen for the ensuing year:

For Director of the Second District, John Forster of Albia.

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For Director of the Fourth District, William Langhan of Cedar Rapids.

For Director of the Sixth District, M. J. Graham of Adel.

For Director of the Eighth District, C. H. True of Edgewood.

For Director of the Tenth District, L. A. Clemons of Storm Lake.

For Director of the Twelfth District, Eugene Secor of Forest City.

THURSDAY MORNING SESSION.

THE PRESIDENT: We will take up the program for the morning. The first thing is the report of delegate to the American Pomological Society, by Wesley Greene, Davenport.

REPORT OF DELEGATE TO THE AMERICAN POMOLOGIAL SOCIETY.

BY WESLEY GREENE, DAVENPORT.

The twenty-eighth biennial session of the American Pomological Society was held in the Horticultural Hall of the Massachusetts Society, which is located on the Black Bay district of Boston, near the park and boulevard system of the city. The Massachusetts Society is to be congratulated on having such a substantial building for its home.

The exhibit of fruit was large; it included the Avocado or Allegator Pear, (*Persea Gratissima*) from Florida, figs with blast phage from California, sand cherries from South Dakota, and apples from Canada, Minnesota and other tates, hot-house grapes from Connecticut, seedling potatoes and mushrooms were also on exhibition. The fruit of the India raspberry, or strawberry—raspberry was also in evidence.

The address of welcome was given by O. B. Hadwin, president of the Massachusetts Society, and the response by C. W. Garfield, the genial man from Grand Rapids, Mich. Our fellow townsman, the Hon. C. L. Watrous presided at all sessions of the convention and in his spirited way imparted considerable enthusiasm to the meeting. During the six years Mr. Watrous and Wm. A. Taylor, the efficient secretary, have been in office, much new blood has infused this somewhat conservative organization. Their successors are J. H. Hale, of South Glastonbury, Conn., and John Craig, of Ithaca, N. Y. Both are young men who have gained a national reputation in their respective fields of labor.

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We cannot in a short report give a resume of all the papers read, so will only note, briefly, some points, which seemed to be of most interest. In the afternoon, Dr. C. L. Marlatt, of Washington, D. C., gave a lecture, illustrated by lantern views, on his journey through Japan and China in search for the native home of San Jose scale. While in China he found a ladybug which keeps the scale in check in its native habitat, and sent some of these beetles to the Department of Agriculture, where they are receiving attention in the hope they may prove of value in ridding the pest from infested groves and orchards in this country. This lecture was followed by one from Dr. L. H. Bailey, of Ithaca, on "The Attitude of the Schools to Country Life." He said the work done by the universities and higher institutions of learning was insignificant as compared to that of the common schools. That the tendency of the graduate from these institutions was away from rather than towards rural pursuits. His plea was for a course of study that would put the child in sympathy with its surroundings. That the child should be trained to see and do, rather than absorb what had been done.

Mr. G. Harold Powell, of Washington, then read a paper on "Relations of Cold Storage to Commercial Orcharding." He said small fruit, pears and peaches were not good cold storage fruits. That the storage of summer fruits generally was, at best, a precarious business. Berries had been kept a week, peaches and pears for a longer time. That fruit taken from the tree in hot weather ripens quickly when put into a closed package. That cold storage does not check the progress of ripening, simply retards it.

The evening session was devoted to essays on the "Progress of Pomology in America." The first paper was by Dr. Hexamer, in which he gave a history of the beginning of pomology in America and the cultivation of wild fruits. He said that the Newtown pippin was the first commercial apple.

The next paper was by Wm. C. Strong on the "Polmology of New England." W. C. Barry spoke of the work of the New York Society and of the labors of Downing and Thomas.

Professor McCune's paper was on "Orcharding in Ontario," 700 miles north of what was supposed to be the orchard district in the early history of the country. Mr. Craig, of Abbotsford, and Mr. Starr, of Novia Scota, told of orcharding in their respective districts. Colonel Brackett then read a paper on "Orcharding in the Middle West."

At the morning session J. H. Hale spoke of "Grading and Packing Fruit for Long Distance Shipment." He said that the fruit should be grown for that purpose, should be well matured on the tree; should be carefully picked, graded and packed in firm packages and placed on the market as quickly as possible. That such fruit, when properly handled would arrive in better condition and be more satisfactory than fruit picked before it had matured. He discouraged the practice of picking fruit in an unripe condition for the distant market. He believes in wrapping the fruit and in grading it carefully so as to maintain a high standard of excellance for the package bearing your brand.

Mr. W. A. McKinnon, of the Canadian Department of Agriculture, gave an account of the Fruit Market Act recently adopted in the Dominion. This law requires that the packer shall put his name on each closed package, also the name of the variety, and the grade of the fruit; it also pro-

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vides that when the package is faced it shall not contain fruit that is fifteen per cent less perfect than that used for facing the package.

G. T. Powell read a paper on "Should the Commerical Grower Plant Varieties of High Quality" and answered it in the affirmative. Dr. W. D. Biglow, then took up the subject of "Pure Food Legislation and its Relation to the Fruit Grower."

The afternoon on Friday was devoted to a drive through the parks. Starting at the Back Bay Fens it included Arnold Arboretum and Franklin Park. No stop was made at the Arboretum in the afternoon, but I spent a day there after the convention adjourned.

The evening session was given up to "Ideals in Pomology," under the direction of Mr. Garfield, and proved to be one of the most enjoyable sessions of the convention.

The morning session was taken up with a paper by Professor F. A. Waugh, on "Judging Fruits by a Scale of Points," and one by Professor W. B. Lazenby on "Waste in Apples," and a discourse by S. W. Fletcher on "Fruit Culture in the Pacific Northwest."

THE PRESIDENT: The report is before you.

MR. FERRIS: I would like to inquire of Mr. Greene in regard to cold storage. If he learned anything in regard to the variety of apples put in cold storage, and if it was practical?

MR. GREENE: I believe it will pay to put apples in cold storage, if they are properly attended to. Storage adds to the expense and does not increase the quality of the fruit. It will not pay to put a low grade of fruit into cold storage. Some varieties keep better than others; possibly this is more on account of the condition of the fruit when put into storage than of the variety itself. The cold storage of fruit is yet in its infancy, and much has to be learned in regard to manner of treatment. The summer and fall apples can be kept fairly well until December, and those maturing later can be kept much longer. Wealthy, Jonathan, Fameuse keep well until March; Duchess not much beyond December.

MR. FERRIS: What system of cold storage would you recommend?

MR. GREENE: That depends on the size of the plant and the quantity of the fruit you would have for storage. It would not pay the average fruit grower to build a chemical cold storage plant. Ice storage is all he could hope for at present, unless he is near to or can ship his fruit to a large storage plant.

MR. FULTZ: I can answer that question. I say it will not pay the ordinary fruit grower. We make our cold storage building pay during the summer for dairy purposes, and then

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turn it into fruit in the fall; we cannot keep it long enough to do any good. We could keep our winter fruit. My experience is just about the same as it is at the College at Ames. We built our building in the fall of 1897. The building cost us $240, for the material in the building at that time; but you must recollect, it would cost just double now. The labor we put on it, was probably $120. You know also that the labor would be worth pretty near double what it was then. It would not pay you to put up a small cold storage building for horticultural purposes only.

A MEMBER: What are the dimensions of your building?

MR. FULTZ: Fourteen feet wide and eighteen feet long. The storage room is below, the walls are of brick, eight feet in the clear. The ice in the storage room is above. For the purpose of keeping the storage room free from frost, we have to have the walls thick. We have to have ventilators on each side, for the cold ventilation to come up. The building above is ten feet to the eaves, the square. It holds forty-five tons of ice. We have to clean it every time we fill it. We get the ice from a small pond that we made in a running stream. With all these conveniences, I can tell you it will not pay you to put up a building for horticultural purposes.

MR. BURNAP: There is one question I would like to ask. Has the enemy of the San Jose Scale been successfully introduced in this country?

MR. GREENE: Well, that is not decided; it is yet in the experimental stage. They have the insect in California and Washington, and have had some success with it.

THE PRESIDENT: Next in order will be the reports of the Experiment Stations. I think, if there is no objection, we will have these reports read and will discuss them afterwards as a whole.

REPORT OF THE CENTRAL EXPERIMENT STATION.

BY E. E. LITTLE.

The work of the distributing committee was outlined early in the spring, and the following plants were selected to be sent to the Central Station, and from there distributed to different substations.

The pollinating work was confined largely to the same stations as in 1902.

The crossing work carried on at the Central Station, was done in the college orchard, and Mr. A. J. Graves' orchard, near the college. The

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conditions at the time of blossoming was very unfavorable for the work, and the results were not very satisfactory. The following fruits have been gathered and the seeds stratified:

Hibernal X Scott's Winter, 12 fruits; average number of seeds, 3.
Wealthy X Jonathan, 12 fruits; average number of seeds, 4.
North Star X Scott's Winter, 11 fruits; average number of seeds, 7.
Wealthy X Scotts Winter, 24 fruits; average number of seeds, 7.
Pattens Greening X Scott's Winter, 2 fruits; average number seeds, 5.
Longfield X Scott's Winter, 7 fruits; average number of seeds, 5.
Virginia X Ben Davis, 4 fruits; average number of seeds, 3.
Anisim X Wealthy, 2 fruits; average number of seeds, 5.
Mercer Co. X Scott's Winter, 4 fruits; average number of seeds, 2.
Virginia Crab X Scott's Winter, 51 fruits; average number seeds, 4.

The past season was very similar to the season of 1902, in that there was too much moisture for the proper care and cultivation of both small and orchard fruits. The tree growth was very vigorous, and is in good condition for the winter. The fall weather was very favorable to the maturing of the wood. It has been an exceptionally bad year for fungus diseases and on account of the almost continuous rains of early spring, many orchardists were unable to spray with any effect. The apples were scabby and inferior in size, color and form. In many orchards the fruit was very knotty, deformed, and russeted. This was due largely to the late freeze April 28th, which doubtless frosted the tissues of the already set fruit and did not allow of the proper development.

Most all of the orchard fruit was inferior. Plums and cherries were a poor crop, and on account of the meager supply prices ranged from $2 to $2.40 for plums, and $3 for cherries. Wherever cherries were planted on moist, wet ground they were badly injured. Those on high ground suffered no damage in growth.

Of the small fruits, strawberries that were on moderately high gorund were of moderate size, and plentiful; but those on the low ground suffered some from the heavy rains, both in quality and texture.

The price at the beginning of the season was 12½ per Hallock box, and at the close $2 per twenty-four-quart crate.

This is the first season that there has been a good crop of red raspberries in this section. Good prices were received. Blackberries were an abundant crop and the season ranged over a long period.

Gooseberries and currants were only a fair crop.

VARIETIES OF FRUIT IN BEARING.

In the list of orchard fruits that have been planted on the Central Experiment Station grounds, there are a few varieties of plums that have begun bearing. The Golden Beauty variety, which belongs to the species *Prunus Hortulana*, originated in Texas. Of the few fruits that was produced this season it appears that it will be of little value in this section. The tree is very vigorous, hardy, and healthful. The fruit does not ripen until very late in the season, and for this reason it will not be of value in this section, on account of the short season.

Another variety that is bearing is the Bestovall, a cross between the Miner and Abundance, originated by T. V. Munson of Denison, Texas. The fruit is about the size and color and texture of the Miner. It ripens

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about the 10th of September, and may be fairly valuable for a very late sort. The tree is very upright, strong, vigorous, and comes into bearing early, and is moderately productive. The foliage is large, and abundant, and resembles the Nigra group, somewhat.

Of the grapes that have fruited, the Hicks variety, which originated near St. Louis, Mo., has fruited the past two seasons, and seems to be a very promising sort. The fruit is dark colored, bunches and berries about the size of the Worden, and quality very good. The vine is a very rank strong grower, and very healthful. It is very productive and the fruit ripens the forepart of September.

The Xlnta is a variety that originated in Texas, and the fruit is a dark color, medium sized bunches, and of good quality. The vine is just a moderate grower, fairly hardy, and moderately productive. It may be of value in some sections of the State after being thoroughly tested.

The Mitchell Peach fruited for the first time this season, and bore a very good crop of fair sized fruit. It ripens the middle of September and on account of its hardiness may be of value in the central part of the State.

Of the raspberries, Crimson Beauty is a very promising sort, with a large bright red berry, of high quality, and moderately firm. The canes are only moderately stout and hardy.

The Haymaker is a variety that originated in Ohio, and is one of the most promising purple sorts now grown. The fruit is of medium size, moderately firm, juicy and of good quality. The canes are thrifty, vigorous, and quite free from disease, and it appears to be very hardy.

STOCK SENT OUT FROM CENTRAL STATION TO EACH STATION IN SPRING 1903.

Scions.

6 Duchess No. 8 Apple.

Apples.
3 Peerless.
3 Bayard.
2 Windsor.
3 Bassett.
3 Banana.
3 Arctic.

Plums.
3 Davenport.
3 Kober.
2 Welty.
3 Nebraska Wonder.
2 Brittlewood.
2 Champion.
2 Ames.
2 Rollingstone X Wolf No. 3.

Raspberries.
6 Cardinal
12 Haymaker.
12 Kansas.

Blackberry.
9 Kenoyer.
3 Newton Plum.

Grapes.
3 Xlnta.

Strawberries.
20 Kansas.
20 Nic Ohmer.
20 Sample.

Ornamentals.
2 Golden Elder.
2 Ampelopsis
3 Nemophantes Canadensis.
2 Cumberland Belle.
3 Eleagnus longipes.
2 Soliel 'd Or.

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REPORT OF EXPERIMENT STATION AT DES MOINES.

BY C. L. WATROUS.

The season of 1903 has been such that no fair judgment as to its value could be drawn from the behavior of any fruit. Everything promised an abundant crop until one day—when the orchards were white with bloom—there came a rain, then a snowfall and at last a freeze that practically killed all the plums, almost all the cherries, most of the apples and small fruits and so weakened the plants that the fruit crop was no test of the value of the fruit itself. After that the gates opened and we had floods of rain with lack of sunlight. Old established sorts and new ones fared alike in the general wreck.

The stock received for trial grew well, except the strawberries, which came damaged.

Out of more than 100 varieties of plums only two tried to bear—the Robinson of the Chickasaw type and Moreman of the Wayland type.

The Dunlap strawberry stood up well and maintained a healthy foliage, bore a good crop of handsome and good fruit. It appears well worthy of further trial and probably extensive planting. The Marie, sent out by the Bryant Company, of Princeton, Ill., showed fatal weakness of foliage and was crippled with rust under the same conditions.

Of raspberries, Gault, Redfield and Miller have been fully tested and found wanting. Eureka has borne early and ripened good crops of fine fruit but has developed such feebleness of constitution during the seasons of excessive wet as to render its extensive planting not advisable.

Of all the Munson Hybrid grapes the Beacon still maintains the lead and seems likely to prove valuable as a table grape because of its sprightly quality and of its ripening thoroughly about the seeds. The hard and distasteful pulp about the seeds of all varieties of the Labruska type is entirely absent from the Beacon.

Trees and plants lived and generally made a good growth so that we may reasonably hope for an opportunity to test them next year.

REPORT OF THE EXPERIMENT STATION AT WAUKEE.

BY M. J. WRAGG.

The work in the Station under my control has given the most unsatisfactory results the past season of any year since I have had control. During the early spring we had very unseasonable warm weather, which prematurely started the buds of all trees, vines and plants. On April 30th and May 1st the weather turned cold; had a heavy snowstorm, and the mercury at my place went down to thirty-one degrees above, which killed a very large portion of all the fruit in this section. Then on May 20th we had a severe local

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hailstorm, and what fruit was left by the freeze was completely destroyed by the hail. We had no apples, cherries or plums to speak of.

In raspberries the varieties of the station did reasonably well, taking into account the ordeal through which they passed. The variety alluded to in this report in former years, as originating in northern Iowa, I have named the "Iowa," in order that it may be designated from other varieties; as I believe it has merit and should be sent out.

In gooseberries, grapes, etc., there was a very light crop in my section.

Some of my new seedling peonies, lilacs and phlox bloomed very profusely the past summer, and many of them gave evidence of being desirable. I have several varieties of peonies that are very double, large, and scented, and especially one white variety, which should be named and sent out. I hope to be able, in another season, to send blooms of some of these flowers to the members of the experiment committee and the station keepers. I am keeping them in as good condition as possible in the station.

The experiment orchard that I top-grafted, under the directions of the experiment committee some seven years ago, blossomed well this season, and would have set a heavy crop of fruit had it not been for the freeze.

A great deal of the stock sent to my station during the past season for planting, was duplicate of varieties that were already out, had fruited and been reported on years ago. I have kept the stock in the station up in good shape, properly labeled, and have an invoice of all the stock growing; have given it good care and protection. I am confident that with the coming of another year, with the conditions more favorable, that I will be able to make a better report.

REPORT OF EXPERIMENTAL STATION AT NEW SHARON.

BY A. BRANSON.

At this station notwithstanding the freeze of April 29th and May 1st, we had a few specimens of the newer varieties of the apple, but only part of these matured sufficiently to make a test. Some of the Thompson seedlings fruited but proved to be only fall apples.

A number of varieties of the plumb trees set some fruit, but mostly dropped immature. Burbank, which were in full bloom on the 14th of April, set a heavy crop but had to be picked before they were fully ripe to save them. We have learned that the Japan and European varieties can be picked for canning as soon as they begin to color and are satisfactory for this purpose.

The Mitchell peach sent to this station two years ago by the committee fruited this year and proved almost or quite identical with the Bailey, both as to season and quality. With another year's fruiting of the McPike grape we can recommend it as the best black grape for general planting. We are also well pleased with the fine red berries of Crimson Beauty raspberry. Several of the new strawberries are proving valuable. Planting the newer varieties will be continued. We are planing to give more care in spraying the coming season.

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REPORT OF EXPERIMENT STATION AT STORM LAKE.

BY P. F. KINNE.

Received at the station at Storm Lake, 1903: Apples—3 Peerless, 3 Bayard, 2 Patten's Fameuse, 2 Windsor, 3 Bassett, 3 Banana, 3 Arctic. Plums—3 Davenport, 3 Kober, 2 Welty, 3 Nebraska Wonder, 2 Brittlewood, 2 Champion, 2 Ames, 2 Rollingstone X Wolfe No. 3. Raspberries—6 Cardinal, 12 Kansas, 12 Haymaker. Strawberries—20 Kansas, 20 Nic Ohmer, 20 Sample. Blackberries—6 Kenoyer. Grapes—3 Xlnta. Ornamentals— 2 Golden Elder, 2 Ampelopsis, 3 Nemophantes, 2 Cumberland Belle, 3 Eleganus longipes, 3 Scions of Newton plum, and 6 Scions of Duchess No. 8 apple; and this fall two plants of Perfection currant. The raspberries and strawberries were packed with the other stock and were in very bad condition, none of them grew, all stock suffered from the excessive moisture.

Strawberries on the experiment grounds were opened by August Luther on May 20th, ten days earlier than any other variety, but it rusted badly. Several seedlings rusted so badly as to be worthless. Sample, Nic Ohmer, Beder Wood, Glen Mary, Clyde, Lovett and Crescent rusted slightly and produced a full crop. Warfield No. 2 was worthless. The only plum fruiting at all was Marcus and three-fourths of them rotted. No cherries reached perfection, except on two seedling trees and then only a very light crop. All varieties of cherries badly defoliated. The late frost spoiled our prospects of a heavy crop. No apples fruited on the grounds but Longfield, Hibernal and a half dozen samples of Ashton. These were injured by hail, but gave promise of quality and of being a keeper.

Pears all blighted but Duchess; Ostrakoff badly blighted. Windsor topgrafted on Hibernal showed some signs of blight. Altogether the season was discouraging for experiment work.

REPORT OF EXPERIMENT STATION AT GLENWOOD.

BY J. P. JACKSON.

My report for the year of 1903 is not what I had hoped it would be, owing to the heavy freeze of April 30th, and a hailstorm later on and the excessive rain during the entire season, the apple crop was almost a failure. Plums entirely so. Peaches, except seedlings in some favorable locations, were also a failure. Cherries that escaped the freeze were destroyed by the curculio; so that the smaller fruits constituted our crop, and in many cases they were unsatisfactory. Therefore, taking the season through, it was the most discouraging the fruit growers of southwest Iowa have encountered.

As requested by this society I transferred all the station stock that was transferable from the Institution grounds to my fruit farm near Glenwood.

About May 1st I received some stock from central station, at Ames, namely: Apples—Peerless, Bayard, Patten's Fameuse, Windsor, Bassett,

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Arctic, and Banana. Plums—Davenport, Kober, Welty, Brittlewood, Champion, Ames, Rollingstone X Wolf No 3. Raspberries—Cardinal, Kansas, and Haymaker Blackberries—Kenoyer. Grapes—Xltra. Strawberries—Nic Ohmer, Kansas, and Sample. Ornamentals—Golden Elder, Ampelopsis, Nemophantes Canadensis, Cumberland Belle rose, Soliel de Or rose, and Elaeagnus longipes. I also received on the 30th last two Perfection currants from C. M. Hooker & Sons, Rochester, N. Y., ordered by C. L. Watrous. This stock has all lived and done well with one or two exceptions, and made a good growth. The stock at the Institution which was too large to remove are in good condition, including several seedling apples of which I made mention in a former report, some of which will be heard from later, and favorably. All fruit trees, vines and plants except cherries, have made a splendid growth, and all fruits bid fair for a good crop next season.

THE PRESIDENT: These reports are all before you now and open for discussion.

MR. LANGHAM: I would like to enquire of Captain Watrous how the Haymaker compares with Shaffer's Colossal?

CAPTAIN WATROUS: This was the first crop of the Haymaker and the season was entirely abnormal. I do not know that I could give any answer at all; it is no fair test. The best red raspberry I had was the Loudon. Really, it was no fair test; they were all in distress.

A MEMBER: I would like to ask how the Crimson Beauty compared with the Loudon, if any one has tried it?

A MEMBER: I grew the Loudon a few years ago, and now I have had the Crimson Beauty two years. I like it very much; it is larger than the Loudon.

A MEMBER: In reference to the Haymaker raspberry, I have had it fruit for two years, and as compared with the Shaffer's Colossal, it is not as large a berry, while it has better foliage and is hardier. But the Cardinal very much outdoes any thing of that class of berries. It is a better flavored berry than the Haymaker.

A MEMBER: How is it for vigor of plant?

Answer: It is the most vigorous plant of any, in the raspberry line I have ever seen.

MR. BOMBERGER: I would like to ask Mr. Kinne as to the points of value of the Sample strawberry, how it compares with other varieties.

MR. KINNE: The Sample, with me, last year did very well; it held up its size. I thought it a little superior to any of the

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larger berries that I have—the Dunlap or any of the larger berries. But there was some objection to it; it rusted a little too much, especially one of the end rows rusted very much. I couldn't quite understand it, but it did. The other end was nearly free from rust; they rusted worse on the highest ground. They did very much better on the low ground. I was very favorably impressed with the Sample. Right on the other side of the road, my neighbor had some and they didn't do well at all.

MR. LANGHAM: Fifteen years ago I gave the Crimson Beauty a fair trial and finally discarded it for want of productiveness. Some of my neighbors came for plants, and I told them if they would give me a contract and if they wouldn't sue me for damages, they could have them all. I remember of a meeting of this society at Cedar Rapids that question came up quite prominently as to the value of the Crimson Beauty. There was some gentleman there from Delaware county; he had a fine patch that year, and he had a fine crop. I remember he was so enthused over it that the next spring he expected to set out forty acres of that variety. I never heard anything from that since. I expect if he ever set out that forty acres he died in the poor house,

A MEMBER: I would like to have Mr. Kinne report on the Cardinal Red or Caulkins raspberry and the action taken by the Northwestern meeting in regard to it.

MR. KINNE: I don't remember that there was any action taken on the Cardinal. The matter was brought up before the meeting; Mr. Wragg gave an outline of his experience and research in regard to a berry found by Caulkins that has possibly been sent out as an Early Cluster. He said that he had failed to find anything like the Caulkins berry; that he had seen it at the New York Experiment Station and in Indiana and various other points and failed to find anything like it, so that he named it Iowa, and some one in the society proposed to name it Iowa, and the society took that action and named it Iowa.

It is different from any berry I have ever seen. I have fruited the Early Cluster and the Scarlet and neither of them are identical with this Caulkins berry.

It is not a rampant grower, rather a slender grower, but comparatively hardy with us at Storm Lake, but an extraordinary fruiter and remarkable for size.

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MR. WILLARD: I got a berry by the name of Crimson Beauty—I sent out some plants two years ago to the Experiment Station; Mr. Wragg had some of the same, too, and also had some they called Caulkins; he says they are identical. It is called up there Crimson Cluster, but I got them from a man by the name of Perry, in Chickasaw county. He said it originated in Chickasaw county and was found in an orchard where there never had been any raspberries planted, and it has been fruited there for five or six years. The last year or two have not been a fair test, I don't think, for any raspberries, but it is certainly hardy; it is not a strong grower; it does not grow over, perhaps, two and one-half to three and one-half feet high. I does not make as many plants as the Loudon and others, but it is certain to produce more fruit than any of those varieties; it is the same berry that has been named Iowa.

In regard to the Sample strawberry, I have fruited that three years with the Dunlap, and a year ago last summer it was a question with me whether it was a more productive berry than the Senator Dunlap. Last year I don't think it did quite as well as the Senator Dunlap. It does not make the plant the Senator Dunlap does. It is a little more rusty; still it didn't rust to spoil the crop at all with me. I do not consider it of quite as good a quality as the Dunlap, but I think it is a berry worthy of trial in Iowa. It has rather a large berry and is marketable.

I also grew the Cardinal raspberry a few years ago. I have not had the Haymaker. I fruited the Columbia. It seems to be very hardy with me so far and free from any disease; it has been very productive. The fruit is about the color of Shaffer's Colossal.

A MEMBER: Do I understand you to say that the Columbian is not a large berry?

MR. WILLARD: No; I say it is not as large as the Columbia.

MR. FERRIS: I have had some experience with the Columbian raspberry. I do not find it hardy. It has a method of bearing on the new cane that grows with the old one. I find it a very large, fairly good berry. I like it better than Shaffer's.

MR. WILSON: I wish to say a word in regard to the Haymaker raspberry. Mr. McGeehon, of Atlantic, as you all know, is a very careful experimenter. He has fruited the Haymaker for three years. I have fruited the Cardinal for two

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years. It is, I think, going to be a valuable variety in many localities, the Cardinal.

Now, the Haymaker is a surprise to Mr. McGeehon and myself. It so far excels all other red raspberries, he says he will discard anything he has got for it. He has fruited it three years. I must say it is of remarkable size, beauty and productiveness and of excellent quality; it is certainly a great acquisition in the raspberry line. It is a very vigorous and strong grower, rather stocky, and it is not very easily propagated, quite difficult to propagate compared with many other varieties. But I do really think it an acquisition, and I believe it will bear up well in shipping. It is of better color than the Cardinal. I was disappointed a little in the color of the Cardinal. It is not that bright red it was thought to be. I think it will be valuable in many places where it will succeed, but we all know that no variety will succeed in all localities, because our localities are so different in regard to soil and climatic conditions. We ought to always locate the places where certain varieties succeed, and then the public will better understand what we are working for. I think we ought to be very guarded in these things. Where some varieties are a great success, others will fail. I am more and more confirmed in that opinion as I live and travel up and down the country and see these differences in localities and conditions—it is conditions, as our vice-president stated yesterday in his paper.

MR. PLUMMER: I want to state in regard to the Haymaker, it has not done well with me. I have only a few plants; I got them from Mr. McGeehon. The cane has done very well, but the fruit is a very light crop. I have been trying to propagate it, but have failed, and unless it does better I shall have to discard it.

THE PRESIDENT: The chair regrets very much to interrupt this discussion, but we will have to proceed with the program.

We will now call for the report of the committee on Awards of Premiums.

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REPORT OF COMMITTEE ON AWARDS.

CENTRAL DISTRICT.

E. Howell, 21 varieties	$10.92
C. O. Garrett, 34 varieties	17.68
Chas. Garrett, 107 varieties	50.00
H. F. Ayres, 20 varieties	10.40
E. Howell, 3 plates pears	1.50
I. W. Lozier, foliage plants	5.00

NORTHERN DISTRICT.

L. A. Clemons, 70 varieties	$31.50
D. A. Pidgeon, 1 variety	.50
M. D. L. Parsons, 40 varieties	18.00
A. W. Hatfield, 14 varieties	6.30
Northwestern Hort Society, 65 varieties	29.25
J. C. Ferris, 30 varieties	13.50

SEEDLINGS.

Charles Garrett	$ 1.00
L. A. Clemons	1.00

Special report on seedling apples will be made later.

A. T. ERWIN,
Committee.

Upon motion duly made the report of the committee on Award of Premiums was adopted.

THE PRESIDENT: We will now hear from Professor Erwin on "Cherry Growing."

PROFESSOR ERWIN: The subject assigned me was Cherry growing, but as a matter of fact, I want to spend the time mostly upon merely one phase of the subject.

For the last two years, especially this year, the cherry trees in Iowa, have been very seriously affected with the plague. About the first of June, if you have noticed, little brown dots, about the size of a pin point appeared on the leaves, which began to spread rapidly and about the first of July the leaves began to turn brown, in cases where the disease was at all severe, the leaves turned very brown and dropped frequently in the middle of the summer. I am sure, in many sections you saw trees naked of foliage about the middle of July. This trouble is entirely due to a fungous disease, the common name

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being, cherry leaf spot disease. I think it has been worse this year than in many years. It is going to have a very serious result upon the cherry crop for the next few years to come. Its prevalence and frequent occurrence this year is explained in a large measure, by the peculiar climatic conditions we had during the season; the ideal conditions for this disease and its growth being a moist humid atmosphere, and these are the exact conditions we had for the past two years in many sections.

One point in which I have been especially interested, is the relation of the location of the cherry orchard to this disease, and also the relation of the different varieties to this disease. In other words, does the lay of your ground have any effect upon the disease, and also, are all the varieties of cherries equally affected by it?

In traveling over the state and other states, I have made a study of these two points and have this fall sent a number of letters and got replies from them and have compiled that information. From the experience of others and from observation, I think there is no question but what the cherry planted on lower ground is always worse affected by this disease; so that one of the first and principal things to do in order to get rid of this disease, is to get the cherry trees on higher ground. I think since the subject of spraying has come up, we have just been a little too negligent. We can plant anywhere, but the common sense thing to do is to get rid of this disease in the first place, and if possible to plant the trees on higher ground. I know of one very large grove near Boone, Iowa, Mr. Myers planted out several thousand trees. Two-thirds of his orchard was planted on low, flat ground. I do not think he has a dozen trees left on that low ground this summer. It certainly ought to teach the lesson of selecting higher ground.

As to the susceptibility of the different varieties to this disease, a number of interesting points have been brought out. We have among the sour cherries (the only class I will consider) we have two distinct types; those with the colorless juice and those with the colored juice. Now, one interesting point brought out, is that the cherries belonging to the first group, or Early Richmond group seem different than those belonging to the Morello group; they seemed to be in much better condition and seemed to have this general characteristic right through. So that in sections of our State, while this disease is serious, one method of getting rid of it is not to plant the English Morello. In many

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places I found the Early Richmond of fairly clean foliage, while the English Morello was fairly denuded and the crop a total failure. Especially, in the Morello, I noticed in a number of cases, where the fruit was partly formed, the tree lost its entire foliage. As a rule, this disease lives upon the leaves; but not always. In a number of cases you will find it also upon the fruit stock, with which it intereferes to such an extent that the fruit is not nourished. We have shown a good deal of indifference to this disease, and from the idea of fruit growing, so long as we have a disease affecting the leaves entirely and not the fruit itself we give it little attention. That is a wrong conception. We want to go back and consider that the leaf of a plant has a very vital and important function to perform. Every particle of plant food is to go through the leaves, which really are the lungs and stomach. You cannot have a plant in good working order and produce fruit of any consequence, unless it has a vigorous and healthy foliage system, and the protection thereeof becomes a very important problem. The question naturally arises as to what is going to become of this disease; what is going to be the result? I think, in some cases, it is really going to be quite serious. You will remember that Mr. Hartwell, from Illinois, asked this question last year, as related to his trees. I had occasion to write him this summer and I asked him what did become of them. He wrote me that three-fourths of the trees were dead.

I think next spring we will find many of our cherry trees in a very weak and critical condition. My idea is, if you have any cherry trees of that kind, that manuring, cultivating, or doing of these things which will tide that plant over—stirring around the tree and working in some manure, to stimulate a good new leaf will be of great help. In this connection, the matter of spraying and preventing the trouble next year would be a vital point. While it has been a difficult proposition to spray on account of the wet season and frequent rains; but despite that it has certainly been a time when we needed to do spraying more than ever. In our orchard at the experiment station we sprayed right through for these diseases. We have not been able to keep it out of the orchard by spraying; on the other hand, there has not been a single tree in the experimental orchard the last two years, that we sprayed, on which this disease has been able to get a thorough hold. In other words, spraying has been reasonably effective, there has been a normal

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growth and the trees are in good condition. One serious difficulty in checking the disease by spraying, is as to late varieties. In some of these varieties the disease gets worse just about the time the fruit is beginning to color up. This is true with some of the Morellos. With the Early Richmond the disease is past before the fruit gets much ahead. With fruit that is colored some, the best thing to use is the copper carbonate solution, that does not stain the fruit.

I think, in fighting this disease, the best thing to do is to get after it once during the winter or early spring and give it to it hot and heavy with a copper solution; you do not need to add any lime at that time.

MR. HARRINGTON: Four pounds of copper sulphate to 50 gallons water, would that be called strong?

PROFESSOR ERWIN: For this dormant stage I would add five pounds of copper sulphate.

MR. HARRINGTON: What method would you have of handling it that strong, say 5 pounds of copper sulphate to 50 gallons of water.

PROFESSOR ERWIN: It is rather caustic, but we make it a point to use firemen's hats and rubber gloves. Perhaps five pounds is a little stronger than necessary, but it does not do any harm.

MR. HARRINGTON: I have been using 2 pound solution and find even that caustic on my hands. I believe it is sufficiently strong to destroy every spore. I would suggest that 5 pounds is pretty heavy.

A MEMBER: Would you put any lime at all in it.

PROFESSOR ERWIN: There is no objection to putting it in. In the summer we put in the lime of course, to prevent the burning of the leaves. It does remove the caustic effects. So far as the tree is concerned, it is not necessary.

One point I would like to emphasize, and that is, in so many sections of the State, we will find our cherry trees very weak next spring, and we should clearly realize the necessity of nursing these trees a little and stimulate them to pull through. If next summer should be a season of drouth, these weak trees would suffer very badly, and we should not neglect to cultivate around them and work in a little manure. I think by doing this

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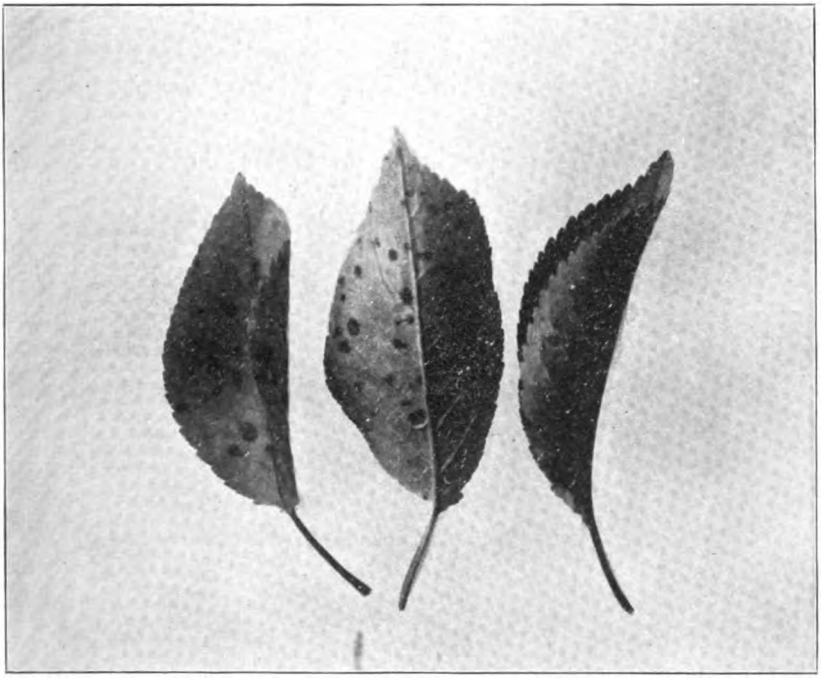

Leaves afflicted by cherry spot (*Cylindrosporium Padi.*) For treatment use Bordeaux Mixture.

Photograph by Charlotte M. King.

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a great many of them will pull through all right and that by another year they will be in shape again.

MR. LINTON: I remember, in my early years, back in Indiana we had a disease that seemed to be an adjunct to this, and for many years we had to depend on the old sour Morello. Up into 1855 and 1860 we had cherries in abundance from the old sour Morello, but at that period the disease commenced on the Morello, and up to 1875 there was hardly a sound Morello tree to be found in the country. Along in 1860 to 1868 the Dukes and Morellos were introduced, and from that on up to the present time, in that country—I don't know only in the last two or three years, whether this disease has been there or not; but I have examined it from every standpoint, and it seems to be the same thing.

MR. PATTON: I would like to ask Mr. Linton or any other member who has had a long observation, if it is not true that the Richmond type of the cherry has uniformly more foliage than the Morello types, the English Morello and the old black Morello?

MR. LINTON: That is my experience in many years of observation; in fact, from my earliest recollections of the Richmond type, that they had a hardier foliage and seemed to resist foliage disease better than most any other type of cherries that I have been familiar with.

MR. BOMBERGER: On that point, in the condition that our cherry orchards have been in the last two years, I would say, that the Montmorency has the most perfect foliage left, as a rule, over Southwestern Iowa, more so than the Richmond.

A MEMBER: How about the Russian varieties.

MR. BOMBERGER: They were more affected than the Richmond. The Montmorency is the cleanest and best of all.

MR. PATTEN: I had a further purpose in asking that question than just to inquire about the behavior of these cherries. It has been my observation, that the Early Richmond and the Montmorency are very closely allied in family relationship and are by far the best in foilage, and this being a very desirable fruit, early in coming into bearing, it appears to me that a strong effort should be made, both at the stations and among individuals throughout the state, to produce new varieties from

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these that are more hardy and better adapted to the condition of our soil and climate. There is no question but that it can be done if we make the effort. My experience with the apples leads me to say, I know positively rapid advances can be made if we will only look about and go to work.

PROFESSOR ERWIN: I would like to say in this connection, that we have at Ames a seedling row of cherries, just such as Mr. Patten speaks of, coming into bearing. We had a light crop last year, and we are very much interested along the same line, and are saving a lot of seed this year.

MR. BOMBERGER: I just wish to state that we have this past week removed a part of our first test experimental orchard that we planted twenty-one years ago last spring. We removed a large per cent that had been affected several times by this disease; the largest per cent we removed were the black cherries; next, the Richmond, and about all of the Montmorency we planted twenty years ago are in fairly good condition. I think more of the Montmorency type than any cherry we have.

THE PRESIDENT: The next paper is entitled, "Bee Keeping and the Orchardist," by Mark Havenhill, Ames.

BEEKEEPING AND THE ORCHARDIST.

BY MARK HAVENHILL, FOX, ILLINOIS.

In treating this subject it is not my purpose to give instruction to old veteran beekeepers but rather to encourage and enthuse the orchardists to become beekeepers, for as F. W. Hall in *Wallaces' Farmer* puts it, "Horticulture and apiariculture go hand in hand, their relations are mutual."

Every one knows that insects, and especially bees, are very instrumental in pollenizing flowers that orchards will produce larger crops when bees work among the blossoms than when they do not. However, this is not the particular standpoint from which I want the orchardist to view the question. It is not, however, without its importance,

The meat packer of the large city is packing meat as an industry and using his by-products for oil, soap, fertilizer, etc., thus increasing his profits. The orchardist is turning out fruit as his product but is allowing the honey that is produced in the orchard and the surrounding country to go to waste. If he would keep abreast of the times he must utilize this product, or in other words, he must keep bees.

Some authorities have estimated that an acre will produce a pound of honey in an ordinary season, but in this land of corn let us say that it will only produce one eighth of a pound. Experiment has proved that bees will

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go three miles for honey; hence, we may say that the area over which the bees of one apiary may forage is about 18,000 acres and allowing one eighth of a pound to the acre, there is 2,250 pounds of honey that is allowed to go to waste every year. If this was gathered by the bees and sold by the beekeeper at a net profit of six cents per pound it would bring $135.00. But this is not all, there is the great luxury which every orchardist would be pleased to have, genuine pure honey, produced in his own apiary from flowers of his own neighborhood. Is there any better luxury than this? Honey is the most healthful and most easily digested of any of the sweets. Yet how many orchardists have it?

But the orchardist objects, he says:—

"I don't think there is enough honey produced in my orchard to keep the bees, the blossoming period is too short, then I would have to attend to my bees just when I should be attending to my orchard and so on."

Perhaps it would be true that there is not sufficient honey produced in your orchard but this objection has no weight for you cannot limit your bee pasture to your orchard for bees gather honey from almost every flower. However a good authority* on beekeeping says that a swarm or colony of bees will gain on an average, twenty pounds, during apple blossoming period in any ordinary year. This means, that there is twenty pounds of honey gathered that will not have to be gathered again and it comes at a very opportune season.

Now as to the care of the orchard and of the bees conflicting, I think there is no trouble. The orchard work begins with the spraying in the spring at the blossoming time. The bees at this time need little or no care other than an occasional glance to see that they are not being robbed. There is a little time between sprayings when the winter chaff may be removed. After the spraying of the orchard has been completed the orchardist has some spare time which he may use to fill his supers with sections, put foundation starters in the sections and get ready for the honey flow of the season. All during the fruit growing season the orchardist can spend a good portion of his time tending to his honey harvest, the orchard not needing his constant care. During the fall the bees should be allowed to fill the brood chamber with honey, thus laying in their stores for winter. While they are doing this the orchardist is tending to his fruit crop. When it is all safe he can again turn his attention to the bees, put on the chaff and fix them for winter.

Concerning the technique of beekeeping I could not even give a general idea in a twenty minute paper, as volumes have been written on the subject. I would, however, advise any prospective beekeeper, and I think there should be lots of them here, to follow the advice of the American Bee Journal when it says: "The fact is, a beekeeper; like any other man, cannot know too much about his business. No one bee paper, no more than any one man, contains all the information there is to be had. So it is best to read as much as you can from as many different sources as you can."

I once asked a beekeeper how he became such an expert at the business and he said. "I first read all the available books on bee culture, subscribed for the best bee journal of that time, 'Gleanings in Bee Culture,'

*Mr. M. Quimby in his book, "Beekeeping."

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read it, then I bought me a swarm and began to practice what I had read. I have always had honey in quantities varying with the season."

Probably the two questions most often asked are, how do you keep your bees from swarming and how do you winter them successfully? There are probably as many answers to those questions as there are beekeepers; hence, I will answer them from my own experience supplimented with advice from my father. In regard to the swarming, I believe it cannot be entirely prevented, but it can be reduced to a minimum and in so doing keep the colonies strong. In the first place we use the Hedon hive which we like very much better than the Langstroth. It has a loose bottom and the brood chamber is in two divisions, instead of a single one as the Langstroth. This gives a bee space in the center of the brood chamber into which the bees build the queen cells hanging them from the bottom or side of the upper division of brood frames. When you desire to go through the swarm for queen cells all you have to do is to check the two divisions of the brood chamber apart, lift up one end of the upper half and there you have the queen cells hanging in plain sight You can cut them out without disturbing the frames or the bees, as you did in the old deep frame Langstroth hive. If none are found here just set the top half to one side and check the lower half loose from the bottom board and you may find them there In ninety-nine cases out of a hundred you will be able to cut out all the queen cells without disturbing a frame. The bees hardly being aware of your presence. If the swarms are thus looked after about every ten days during June, July and August, there will be very little swarming. In looking over the swarm it is well to keep an eye out for drone brood and when found decapitate the cells with the honey knife and replace the frames in the hive. The bees will cle n out the dead drones and the cells will be filled with honey usually. Occasionly a queen cell or two will be missed and then a swarm will issue. If you want to increase your number of colonies then put them in a new hive with a card of brood taken from a good prosperous colony and you will have them safe as they very seldom leave a hive thus treated but will go at once to work growing and drawing comb.

In regard to wintering, my father says that he observed when a boy that if you kick open a bundle of chaff on a hummock in a stubble field or elsewhere during the winter, you would always find your chinch bugs high, dry, and prosperous. He just applied this information to wintering bees. The hives are set upon four bricks placed on a little rise of ground so that surface water will not bother, the hive is inclined forward so that water will run out instead of into it. He puts a burlap cloth on top and next to his chaff super, as he calls it, which is simply a sack of burlap filled with dry chaff, with an old super inverted over it. On top of this the cover is placed tightly and sometimes weighted. The chaff and burlap absorb the moisture given off from the bees and keeps them dry and warm. The entrance is closed down to about two inches and usually some corn stalks or straw placed around the base to keep the cold winds and snow from blowing under the bottom of the hive. Always, immediately after every snow or high wind that drifts the snow each hive must be visited to see that the entrance is open and not clogged with snow or ice. If it is not kept open the bees will smother for lack of air. Of course the brood chambers should

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always have an abundant supply of honey with which to go into winter quarters.

In regard to the further knowledge of methods of handling and apparatus, there are several good books and a couple of journals which will give abundant information. Of the books I will mention the following: "A B C of Bee Culture," by A. I. and E A. Root. "Forty Years Among the Bees," by Dr. C. C. Miller. "Beekeeper's Guide," by Prof. A. J. Cook, Pomonia, Cal. "Langstroth On the Honey Bee," by Rev. L. L. Langstroth, who is called the Father of American Bee Culture.

THE PRESIDENT: You have the paper before you for discussion.

MR. REEVES: I would like to know what kind of bees you are obliged to keep.

MR. HAVENHILL: My father started in the bee business thirty years ago. He started with the Italians. After a while he run across a good swarm of black bees and he took charge of them. We have black bees and half breeds—the only difference I can see, the black bees are a little more saucy than the Italians. I do not think there is any difference in their gathering capacity, so far as my experience goes. There is another point: a great many people will tell you the Italians can gather honey from red clover; so can the black bee. If you will notice them working on the first crop, and watch them closely, you will find they are gathering pollen, instead of honey; but on the second crop, if you will watch them closely, they get some honey, for the reason that the tube is shorter.

A MEMBER: What is the best lotion for a bee sting?

MR. HAVENHILL: Prevention, I think is the best. In the nature of a cure, ammonia is considered good; I don't know, I never bothered about anything. For a lotion, soda water is good, if you make up a strong solution, ordinary baking soda.

MR. HARRINGTON: Isn't it true that in the spring, when they begin working, the first stings you get seem to hurt more, and after you become accustomed to the stings they have very little effect?

MR. HAVENHILL: That question I can answer only in this way: that it affects different people differently. I have seen my father have fifty stings on the back of his hand; if one stings me, that is all I want.

MR. HARRINGTON: I would like to know if you use anything as a preventive?

MR. HAVENHILL: Well, smoke; before you go after the bees, put smoke in the entrance of the hive and smoke them good and

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strong. The idea of the bee seems to be, when there is anything comes around to disturb them, or they see danger, to save as much of his store as he can, and he begins to fill up on honey; the effect is that he gets loaded and cannot get around very lively. If you will smoke them so they cannot get to you, they will immediately go in and eat.

MR. HARRINGTON: Occasionally you find swarms very vicious, and in case of that kind a very simple remedy is to use the common puffball, broken up and mixed in with the other materials generally used in the bee-smoker; it produces smoke very freely and is quite pungent. Smoke freely for fifteen seconds and after one minute or two at most, open up the hive fully to the air. You will find your bees in a state of semi-stupification and with no more desire to sting than so many flies, and you may continue your work with them as though your relations had always been cordial. I have found one smoking with it sufficient with the most vicious colony, so that they would not offer to sting again that season more than the ordinary swarms, which has been very little with me. It has been wild bees from the timber, a few miles away, that with me have occasionally wanted to run the ranch. I have never seen even the slightest injurious effect from use of this remedy. This puffball is plentiful in our pastures and should be saved when ripe and dried.

MR. LINTON: I would like to help the young man out. He has not got over the line of experience that old gray-headed men have who have handled bees for thirty-five years. Smoking can be overdone.

The object of subduing the bee is just like us men when we get our stomachs full, we are easily controlled; when we get a bee full we have it at our command. That is the secret. Where they are out, away from the honey, such as swarming, the best thing then is sweetened water. If you sprinkle them with sweetened water, then they go to work on that and you will soon have them under your control. When you have their confidence, the same as you have with a hog, horse or cow, you can handle bees; until you have that confidence you are a failure with bees.

As to the amount of honey per acre—in a well set field of red clover—there is as much as a ton to the acre during an entire season's bloom.

MR. PATTEN: I would like to say a few words about bees. I have about 2,000 fruit trees and 100 colonies of bees. I want to

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say I handled these bees last year and I do not think I or the help through the entire season got twenty-five stings. Every time I got a sting I felt I made a mistake. If I had to be stung as some speak of here I would go out of the business; I want to tell you it can be done without. I want to say another thing; if you smoke them, you can do a little bit when you first go to them; if you smoke them a great deal you will injure them.

MR. J. WRAGG: There is just one matter here I want to call to the attention of the members, after which they may go back to the discussion of this subject. I know we neglected it a year ago; it has been discussed by the board of directors, as to the advisability of changing one clause in our constitution. As it has been heretofore, whenever a bill came in to the secretary for any expense, the first thing he would do would be to take the bill and send it to the president. The president perhaps would live at Waukee, Osage or some other place, and he would draw a warrant and return it to the secretary. The secretary, you know, is our executive officer proper; then the secretary would take that warrant and send it to the treasurer. I propose to introduce an amendment to the constitution at this meeting so as to take this burden off the president, and to have these bills kept at the office of the secretary, and that the secretary may draw the warrant and then send it to the president for him to countersign; in our agricultural department it is done that way.

The amendment reads as follows:

Strike out the second clause, beginning with the word "he" in line two (2) and ending with the word "Secretary" in line four (4) and insert in lieu thereof the following:

"He shall pay out no money, except upon the warrant of the secretary, countersigned by the president."

CAPTAIN WATROUS: This amendment would seem to be simply in the interest of a better and more enduring administration of our financial affairs. An order comes in here—the secretary has a permanent office—he is comparatively a permanent officer; he has charge of this record; it is subject to the approval of the president, exactly in one case as in the other, the resulting difference being, that the record will be in this office, which is the safest place we have in the State. Each officer will have his election whether he signs it or what to do with it, the same as before—it seems to be in the interest of more orderly doing our business.

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THE PRESIDENT: Under the constitution, as I understand it, a motion to endorse would now be in order.

CAPTAIN WATROUS: I move the endorsement of this amendment, because it seems to me to be in line with a more orderly transaction of our business.

(The motion was duly seconded and carried by 38 votes for the amendment and 8 votes against it.)

THE PRESIDENT: I see we have with us Doctor Bailey. He represents the horticultural interests of the Iowa Commission. I would like to introduce Dr. Bailey.

DOCTOR BAILEY: I am very glad to be with you. I believe you have assigned me a place on your program this afternoon. I will be ready to do at that time what I can, except I would like now to become a life member, if you will permit me.

MR. SECOR: Doctor Bailey has stolen all my thunder. I was going to move that Doctor Bailey be made an honorary member of this society.

DOCTOR BAILEY: The reason I wish to do that is this: My position will last but a short time; I expect to last a good many years, and this society, too, and I want to be with you just the same.

MR. REEVES: Since we have but a few moments left, we may return to the discussion of bees, and with regard to smoking them. I think I have learned something in that regard. I have a neighbor who is a good beekeeper and he is a good fellow; we often spend an afternoon together among the trees and flowers. I have seen him with a hive all taken to pieces and the bees crawling all over him. I never knew him but once to get a sting, and he said then he made a mistake. I believe it is just the same as receiving a kick from a horse or an injury from another animal; you make a mistake. The idea of getting the bees to fill up with honey, is a mistaken idea. You want to avoid that. When you first come to the bee-hive give them just a little smoke; this makes them less active. To give them a great deal of smoke will make them angry. Give them a little time after you smoke them, to have it take effect; then open your hive and do as you please with them. I do not see why every fruit grower does not keep bees. You can keep a few colonies of bees and supply your family with honey.

In the matter of different kinds of bees, I find the Italians more quiet than the black bees. I believe they are as much

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nicer than a Jersey is better and prettier than any other cow. I like the Italians much better.

MR. BOMBERGER: I like to approve of the thought and suggestions of Mr. Havenhill, that of associating orcharding with side lines, and especially through the off years of apple-growing the orchardist is confronted with an apparent loss of time. The suggestion is a good one for any person, if his taste can be made to run in that line. Some people might prefer poultry; a good, large orchard might accommodate shoats and hogs. I like to commend that thought in the paper.

As to bees working on red clover, our observations, covering a number of years in a newer prairie section of the State, where bee pasture has been somewhat at a premium and scarce up to later years, since the farm pasture has been overgrown with white clover. As to the temper of honey bees, the whole hive must be considered in the aggregate. They have a temper a great deal like individuals. Some of them are saucy; some of them are good, and still others are indifferent at times. I do not think when one approaches a hive he ought to go to work and do a lot of smoking. The proper thing to do, is to just alarm them a little. My theory is, when you get to the hive, if you make a rap, it scares them; if you rap very hard, they will fill with honey. If you will just scare them a little and then raise a little, a small amount of smoke, they will go down without gorging. If they are quite saucy, throw considerable smoke in the front and top. It is a great mistake to get a hive of bees in such condition that you can hardly handle them. The gentler you are with it the more easily you can handle them.

MR. WILSON: I have been somewhat acquainted with bees for more than thirty-five years, and have heard statements here this morning that really surprise me; that in keeping bees you had to go to war and get into a scrap every day. My experience, which has been somewhat limited, with bees, has been, that they respond to kind treatment; you want to get acquainted with your bees, and they will get acquainted with you pretty quick; they recognize kindness. I have attended to my bees for years without getting a bee sting. I simply went at them as though they were friends. I have handled bees in all sorts and forms; have taken them in my hands, scooped them up carefully and put them in place. You can just handle them as nice as you please if you get acquainted with them. It is the same

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way with our domestic animals. You take a milch cow, for instance, and you treat that cow kindly, she will become just as gentle and nice as a lamb. I believe the same rule applies to the little bee. It is a smart insect; it knows more than you think it does; it does love kindness.

In traveling this fall, I called on a gentleman who had 100 stands of bees. I called at the house, and his wife said he was out among the bees somewhere. I went right out where he was, and he told me to better look out, they would sting me. How he was surprised that I sat right there with him. A bee once in a while would come up, but they seemed to think I was all right, I didn't come there to get into any trouble or scrap; though they saw I was a stranger, I had no trouble with them.

A MEMBER: I think these two gentlemen struck the keynote about handling bees. Mr. Wilson referred to the cow; I milk a number of cows. I can milk them in the lot; I can put them in the stanches or anywhere around the yard. If you jump right at a cow, the most gentle cow is liable to kick. I do not believe in gorging them. I have handled bees more or less for years, though not in late years. I have tried gorging a time or two myself. They are just like us men; the more careful you handle them the better you get along with them. If a lot of men would undertake to force you to something, it is only natural for you to begin to kick. So it is with the bees; the more careful you handle them the less trouble you will have. The author of the paper threw out some good light about the hives. I find, my greatest trouble is, they will cross from one frame to the other and it is a good deal of trouble to take them out. There is one more thing, that is in regard to wintering bees. One year I put them in the cellar. I lost every swarm. I never practiced the theory the author suggests in the paper, but I have left them out in the winter and lost swarms that way. This year I have a building that I move into the orchard and I moved all but three hives into that building, and I have closed it up and it is perfectly dark when you go in there. I have my bees in that room now. What will be the result? Have any of you had any experience along that line?

MR. HARRINGTON: I think, perhaps I ought to give a word of warning in regard to the use of smoke. I agree fully with the gentleman here in regard to handling bees carefully. I too believe that a man makes a mistake when he gets a sting, although

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there are exceptions; we have very ugly swarms of bees; they are naturally so. The mistake I made, I was up in a tree top.

WHOLE ROOT VS. PIECE ROOT GRAFTS.

BY A. F. COLLMAN, CORNING, IOWA.

Mr. President: This world has always been full of delusion. It began under the tree of knowledge and will likely live and flourish long after the latest humbug has died with the rex of time.

No class of men have been handicaped, and crippled by misrepresentation in business, as have the honest nurserymen who are selling the trees at living prices. He has had to face the kid gloved gent with his tree strawberries, budded apple tree and sweet gooseberries, who probably never budded a tree or even saw one budded; that travel on a borrowed name and buy cheap trees and plants at wholesale, to fill their orders and don't care whether the stock is true in name or otherwise, budded or grafted on whole or piece roots.

But the greatest delusion of the present age, in the business world, is the whole root grafts. It is not advisable, if it were practicable. It is now an established fact that only 10 per cent of all our apple seedlings are hardy enough to stand our severe winters, even as far south as the fourtieth parallel. It is a Divine command to build on a solid foundation, and we know that this is true in all practical and scientific questions. The whole root man tell us that the seedling root forms the tap-root for the tree to draw moisture and nourishment to make the tree long lived and fruitful. When just the opposite is true. Roots will go down to moisture than branch off after nitrogenous food for the tree, so we see it is not practical to graft a short scion on a whole root from 15 to 18 inches long, when only one out of ten, south of the fourtieth parallel would stand our test winters without protection. We can always judge the root system by the top of the tree. All light, upright tops never have a good root system and invariably have a long top root with but few surface feeding roots and to apply this to a fruit tree, we know that the same rule will prove true. We would never look for abundance of good fruit on a light upright toped tree. Why? Because it has a poor root system. Its roots run deep and produces wood instead of fruit and on the other hand, a tree that has a good open top, always has a good root system that branch out far from the tree to gather food for the tree to develop its crop of lucious fruit. This rule holds true with all nut bearing trees, for if we wish to plant any of our nut bearing trees for fruit, we must transplant them. And to do this we usually cut the tap root to do the work nicely. So you see, we believe in the piece root system and would plant no other. We would use a short root about three inches long and a long scion about six inches long, and set down to the top bud and then cultivate thoroughly and the surface feeding roots will usually start from the scion, then you will have a tree on its own roots, so if your scion is hardy and your work is well done, you will have good tree, with a good root system that will stand our hard winters, produce plenty of luscious fruit, reward the planter, and laugh at the storm.

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AFTERNOON SESSION.

THE PRESIDENT; It is necessary for us to commence promptly this afternoon in order to complete the program. The first paper on the program this afternoon is entitled "Busy Days," by William Langham, Cedar Rapids.

[NOTE—The papers from Messrs Langham and Conaway were not received in time; they may appear later in the report.—SECRETARY.]

THE PRESIDENT: The next in order will be a paper entitled "Horticulture at the St. Louis Exposition," by F. R. Conaway, secretary of the Iowa Commission.

THE PRESIDENT: I do not think Mr. Langham's paper should be let off too easy. You will now have a few minutes for its discussion.

MR. BURNAP: What do you pay your pickers?

MR. LANGHAM: For raspberries, 2 cents a quart; for strawberries and blackberries, 1½ cents per quart.

MR. PARSONS: Who boards the pickers?

MR. LANGHAM: They board themselves.

MR. BURNAP: Do you give any edge to the pickers that stay during the whole season?

MR. LANGHAM: No; 1½ cents.

MR. BURNAP: Do you have any difficulty at the last end of the picking to keep them?

MR. LANGHAM: Sometimes at the last end we offer a little premium.

MR. PARSONS: What variety have you found most profitable?

MR. LANGHAM: Well, I can hardly answer that question. Our raspberries—the Kansas, Cumberland, Gregg, Nemaha and several other varieties.

A MEMBER: I would like to ask what variety of pickers you have found most profitable?

MR. LANGHAM: Girls always, as against the boys. I thought if I lived to write another essay I would write one on the pickers, for they deserve a chapter.

MR. PARSONS: What variety of strawberries do you consider the most profitable?

MR. LANGHAM: The Warfield, Bederwood. The Warfield is the great leading berry up our way.

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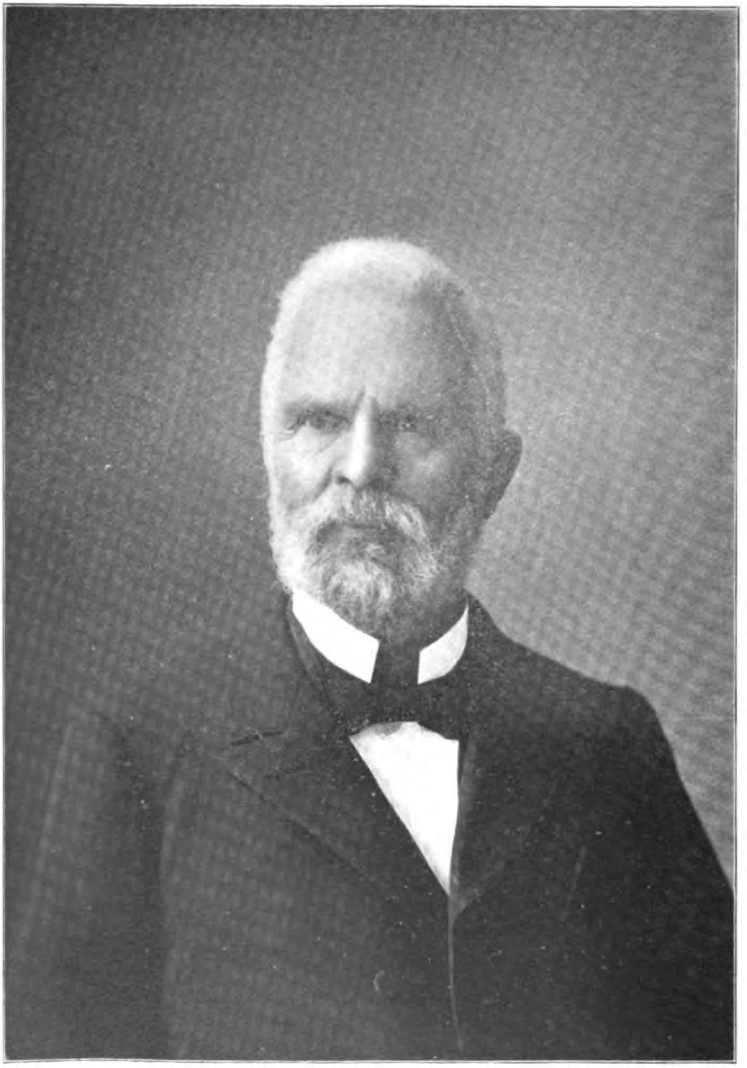

C. W. BURTON.
For seventeen years Secretary of the Southeastern Horticultural Society.
(See page 276.)

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MR. BURNAP: I can say to Mr. Langham if he can find a tally man that can tally the pickers I want him to send him to me; it always took two men for me.

MR. LANGHAM: If you are getting over forty crates a day, it makes a wonderful amount of work for the tally keeper. Of course some of the pickers crate them for you; that is the object in having a large crate.

MR. BURNAP: Some of these fellows that have leaves in the bottom are very glad to crate them.

A MEMBER: Mr. Langham, there is a point I would like to ask about; say you pick from 9 o'clock until 2 in the afternoon, and you are pretty nearly cleaned up, and you have from 75 to 100 out at 2 o'clock, do you move your berries right away to town?

MR. LANGHAM: Just as quick as there is a load it goes right to the city; generally about 10 or 11 o'clock; then again another one at night. With us there have been trains going up northwest about midnight that carry berries to the northern part of the State; we generally have to get them down in the evening; otherwise we leave them right in the tent.

A MEMBER: My experience has been, where there is a large quantity of fruit that is perishable, it is possibly best to let it stand until it is very cool before moving it; it is better if you can leave it until 4 or 5 o'clock before you move it; I like to have it cool until night and towards morning haul it to neighboring towns, between 2 o'clock and daylight.

THE PRESIDENT: I think now, we will hear Doctor Bailey's paper, entitled "The Iowa Exhibit."

THE IOWA EXHIBIT.

BY DR. S. BAILEY, MOUNT AYR.

Mr. President, Ladies and Gentlemen:—I want at this time to acknowledge the honor conferred upon me by having my name placed on the program for this meeting. I appreciate fully the honor and am none the less sensible of my inability to meet the requirments of the occasion; but notwithstanding all this I have had the temerity to make the attempt.

From the earliest orthodox record of the human race fruit has always played an important part in its history. Go back with me in your imagination to the Garden of Eden; that famous place had scarcely been created and peopled till the most important transaction ever known to the human race was enacted through and by the agency of fruit. Eve offered Adam a good apple; he could not resist, who could?

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Do you remember the history of the great wanderings of the children of Israel in the desert? And why were these wandering? With one object in view, substantially one, to find a land that had good fruit, and when once found the wanderings and weary journeying was at an end.

This is only two illustrations to show how important ever has been the eagerness of the human race to find a land of good fruit.

When Columbus discovered America he found without doubt the greatest land of fruit ever known to mortal man. It has taken centuries, however, to establish this fact. It has taken the brawn and brain of generations to bring to grand perfection the results of the present time. It may be noticed that along the history of the world the higher the type of civilization the more and better become the fruits of the land. Who ever heard of a savage people eating fruit? Did you ever hear of a cannibal having a fruit salad or an apple for dessert? No, but quite the contrary—the more savage and vicious the race the less fruit and vegetables they eat. What was the condition of affairs regarding the cuisine of the people when this fair land was discovered? They were wandering about in a wild state, tearing and eating half cooked flesh, and fruit to them unknown; and in view of this fact is it any wonder they were savage? Show me a people and tell me what they eat and I will tell you what they are.

As civilization advanced it became customary for the people to create special times or days set apart for the purpose of exhibiting the products of land and labor of towns, counties, districts, states and nations. There were exhibited at such times all kinds of manufactured products, works of art, the useful and the products of the soil—fruits and cereals. Of all products perhaps the most attractive of all exhibits would be that of fruits and the fruit of the vineyard. In later years at these state and national exhibitions Iowa has always been a prominent figure and in fact a leader in all things pertaining to horticulture and agriculture. This was notably the case at the Columbian exposition at Chicago in 1893 and also at the Trans-Mississippi exposition at Omaha in 1898. It is the intention of the Iowa commission of the Louisiana Purchase Exposition in its department of horticulture to far exceed all previous exhibits at the coming St. Louis World's Fair, nothing will or can prevent the consummation of these plans save two factors alone—one a failure of crops, and the other a failure on part of the World's Fair people to hold an exposition—providential intervention, of course, always excepted.

But I am admonished that my time is limited and I must leave off theorizing and moralizing and pass directly to my subject, namely, "The Iowa Exhibit." This, as you all know, means the display Iowa will make in horticulture at the St. Louis World's Fair. When the committee of our commission having in charge the assignments of departments announced they had assigned me to the department of Horticulture I was scared and shocked. The honor seemed too great, the undertaking too colossal for me; but I was persuaded to accept, and I did. The first thing I began to do was to look around for sources of information and some haven of refuge. I found them. I found the Iowa State Horticultural Society and I began looking up the record and found that they had even thus early, December, 1902, made plans to help out the Iowa commission. In their meeting of a year ago they had suggested or presented one of their number, tried and true, to be superin-

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tendent of horticulture, and at their suggestion and the counsel of the commission I selected their man, Mr. Silas Wilson, as superintendent of my department. He brings to his work the results of years of experience, making him the right man in the right place. Ever since I began the work I have had the hearty co-operation of the members of this society a d I have had the same report from Mr. Wilson. The year has been, as you all well know, one fatal to apples, the general report being that the quantity was small and quality inferior. But notwithstanding all this we have been able to secure a quantity and quality of fruit that we can start out with as fine prospects as any State in the Union. We will have the finest space in the building, and by far the best facades, fruit-booths, tables, plates and apples ever shown on earth. This will be for the first thr e months. Then will come such displays of fresh fruits during July, August, September, October and November as the world has never before seen, provided, however, always, that the Iowa State Horticultural Society and its individual members continue to give us in the future as in the past their hearty co-operation and support. This given to us and we will add fresh laurels to the State of Iowa and honor this society.

THE PRESIDENT: We will now hear from the Hon. Silas Wilson, on the subject of "Fruit for the St. Louis Exhibit."

MR. WILSON: I have not prepared a paper on this subject, for the reason that I am hardly far enough along, yet I would be very glad to talk a little to you and give you some of the experience I had and what our prospects are.

In the first place, we had a very unfavorable season, and the conditions of the fruit crop over the State were certainly about as poor as I have ever seen them. The first week I traveled about a thousand miles and visited about forty orchards. I was really discouraged and didn't know what I was going to do. I found, as a rule, that the fruit was in spots and streaks; you would find a few varieties in one orchard that were very fair, and in another orchard a mile or two away you would find different varieties, and so it went all along. In the meantime I wrote about four hundred letters and received about thirty-seven replies. I visited many of these men; they didn't have any fruit and didn't consider it worth while to answer.

I finally made up my mind the only way to get an exhibit was to go after it, and the result is we have a very fair showing. We have more than eight hundred bushels of as good apples as we had in the State this year. I simply turned over everything else and gave my time for five weeks and pushed it early and late, many days driving all day and not a good apple to be found.

I had this to encourage me; everybody I met was cordial, enthusiastic and patriotic, and I think we have a great deal to

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encourage us after all; if we should be favored with a good fruit season next year, we will be able to carry out fully what Doctor Bailey outlined. If we have a good season for fruit, we will have an exhibit that will make you all smile.

I might name a few of the gentlemen who have so kindly assisted me. I think there are twenty-one in all who have contributed something like 800 bushels.

Those who contributed fruit were: J. C. Ferris and B. F. Ferris, of Hampton; Edson Gaylord of Nora Springs, Mr. Felter of Washta, Mr. Bordner of Onawa, Mr, McGinnis of Griswold, Mr. Snyder of Center Point, Mr. McCoy and Mr. Matthews, of Knoxville; Mr. Moffitt of Corning, Mr. Martin of Mount Ayr, Mr. Ivins of Iowa Falls, Mr. LaFever of Earlville, Mr. Ayres of Wilton, Mr. Parsons of Irvington, Mr. Wagner of Sunbury and Mr. Ridgeon of New Providence.

Now, I think, with all these assurances and what we have to begin with, we have all that is necessary, if we have a good, seasonable year for fruit. I am disappointed in my showing; I would like to have had nearly double the amount of fruit we have, but I could not help it under the conditions.

The report of Mr. Silas Wilson was received with much enthusiasm. Further suggestions and recommendations were made by Captain Watrous, Mr. Patten, Mr. Wragg, Mr. Parsons, Mr. Bomberger, Mr. Ferris and others, as to the gathering of the fruits next season, for exhibition purposes, beginning with strawberries and ending with the late winter apples, and the members generally were urged to do all they could to render assistance in every way possible. It seemed to be the concensus of opinion, that with a favorable season, the exhibit of the horticultural interests of Iowa would be highly creditable.

CAPTAIN WATROUS: Would it not be in order, at this session, to take up the matter of amending the constitution, which amendment was read and endorsed by the society at a preceding session.

THE PRESIDENT: I think the amendment may now be voted on in regular order. The Secretary will please read it.

(The amendment was duly read and upon motion passed by a unanimous vote.)

MR. BOMBERGER: I would like to submit a resolution in regard to the keeping of a permanent register in which to record all new fruits:

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Resolved, That the Iowa State Horticultural Society establish a permanent register and record of all new fruits, as well as those in general cultivation in the State of Iowa; and that the secretaries of the state and four auxiliary societies and the acting station keeper of the Station at Ames, act as a permanent outlook committee, and as a committee of nomenclature, to have charge of same.

That $100 be appropriated, or so much thereof as may be necessary, to properly start the work.

I move the adoption of this resolution.

CAPTAIN WATROUS: I would like to have the treasurer state whether we have a surplus of funds, so as to take on additional burdens.

MR. WILSON: Can this body make an appropriation of that kind? I think the Board of Directors is the only body authorized to make appropriations; that is my understanding. This might be referred to the Board; it carries with it an appropriation.

(Upon motion duly made the resolution was referred to the Board of Directors for such consideration as may be deemed advisable.)

The committee on report of the Treasurer's Report reported as follows:

REPORT OF COMMITTEE ON TREASURER'S REPORT.

The committee on Treasurer's accounts begs leave to report that the books and vouchers of the Treasurer have been examined and checked and found to agree with the report as made to the society.

EUGENE SECOR,
M. J. GRAHAM,
W. O. WILLARD,
Committee.

Upon motion duly made the report was adopted.

THE PRESIDENT: We have yet a little time before adjournment, and we may take up the question box.

MR. PATTEN: I will say, Mr. President, I had hoped not to be here this evening when these questions were taken up, and since there were some remarks made on a question that attracted my attention, and that seemed to cast some slight reflection upon the work of cross pollination, although I do not think it was so intended, I would like to offer what I may want to say now, as I stated, I do not hope to be here tonight.

The question I desire to discuss, is No. 27, and reads as follows:

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"In the light of past experience, does the method of cross pollination by hand, as at present practiced, promise satisfactory results, particularly with the apple?"

When called upon to make my report, from my station, I didn't respond, because I had but little to say. I thought I could combine the two and save time.

Before proceeding to this question, I want to make a little statement in reference to cross-pollination of the pear this year; that, I think, will interest the members of this society. I was in California last winter, and at the blooming time, the Winter Nelis pear being there about thirty days in advance of the blooming period in this country, I gathered very carefully some pollen of that variety. My experience with pollen that had been sent to me different times, led me to be very careful in the preparation of it. I sent it home and after about thirty days my man worked that pollen on the Kieffer, on just one limb of this tree, picking off the rest of the bloom that was not worked. We secured on that limb eleven pears, and there was not a single pear matured on the tree besides it. That, to me, is quite remarkable.

Now, as to this question of the pollination of the apple, it should be understood, that in the beginning of this work of pollination, about 12 years ago, we absolutely had no data from which to begin; the varieties with which we had to deal of the American type, were all mongrels and we absolutely knew nothing of the pedigree of any variety we dealt with. We had on the other hand, the Siberian and Russian varieties that we knew to be a thoroughbred character; but, of course we knew nothing of their pedigree, only we knew they were thoroughbreds. When we began this work we selected the pollen of the Roman Stem; this work was done under the suggestion of Colonel Brackett. We worked on the Pink Anis quite a good deal, because it was said to be a very hardy variety and we thought that was a very desirable cross to make. Had I known then what I realize now, I never should have used the pollen of the Roman Stem, from the fact that about twenty years ago I had planted seeds of the Roman Stem and they gave me one of the most miserable seedlings. Today we know, that no variety should be selected that does not give strong seedlings, like the Ben Davis and Malinda, for instance; so that the result of that work was, the Pink Anis, being such a hardy type, overcame the Roman Stem until there was not one out of fifteen or twenty varieties that was so

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cross-fertilized that was worth anything. We took the pollen of the Briar Sweet and crossed it with quite remarkable results. Out of all seedlings, six of them have borne and all have produced sweet apples; but we ran right up against the Siberian thoroughbred. I hope that will be of some value; and there are others yet to fruit in that list.

A further and later experiment has been made—the Wolf River has been used on the Briar Sweet and others. But I will pass on—later experiments have been made on Patten's Greening, Grimes Golden, and there we get much better seedlings, because the extreme hardiness of the Greening and from the parentage itself, from the Duchess and the Rhode Island Greening; at any rate—this Greening has demonstrated through its seedlings to be most potent. We have demonstrated certain things that are coming down to a scientific basis upon which experiment stations can go on and build, and until we have experimented far enough to do that, we are all at sea.

Some gentlemen may say, after all these twelve years we have accomplished nothing, but if they will think back and see what has been accomplished in the beet—from 5 per cent to 23 per cent sugar. Look at the corn out here on the tables. How long has it been since men began to study the breeding of corn and certain characteristics in it; making corn so much more valuable to the pound than anything we have known of before. Shall we, because this is a long road to travel, say we shall be less scientific as a horticultural body, than the men who are dealing with corn, beets, cattle and horses?

In this experiment with the Grimes Golden and the Greening, notwithstanding the unfavorable year just past, I can see something in that, of a great deal of hope; and as I indicated before, it is just simply preparatory work, laying the foundation; and there is no more question in my mind, from the experience that I have had, that we can take this data that has been secured by the experimentation at my place and other places, and go on and build up, and in perhaps twenty or twenty-five years know something of what we are doing. There is no more doubt about it than there is that we are here.

This meeting at Ames was referred to. I had the honor of reading the only paper that was presented at that meeting, and some few of you gentlemen here know—I do not want to talk of it—it was one of the most painful recollections of my life.

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I will say, gentlemen, at that meeting, I brought with me specimens of seedling trees I had produced: I brought with me the leaves of these trees. I predicted at that meeting that the trees that we were to produce in this country, the trees that were to make our successful orchards for the whole great northwest, would be the trees that were produced right here in the climate and soil of Iowa and the northwest. I stand right on that proposition today; I think I can show you evidences of it.

I hope in another year, gentlemen, to be able to show you crosses of the Grimes Golden and Patten's Greening that will be a most decided advance of anything we have yet done. I want to say further, we have the Siberian proposition before us; how to produce these long-keeping and desirable apples we want, is a very great problem, because we have not the long-keeping, hardy variety to cross fertilize with some such variety as the Grimes Golden and breed up. and there is no more question of the result, than there is that the sun will rise and set.

MR. WILSON: This talk of Mr. Patten's is quite an inspiration to me. I was a member of this society when Mr. Patten's ideas were hooted at, because he lived in the north; he cannot grow anything up there but Siberian crabs. I remember one time, in Marshalltown or Iowa City, when this question came up. I remember Mr. Patten was there; he was, of course, giving his idea of how they were growing seed in the cold north and some man put that at him, as though it ought to quiet him: "You, of course, can grow Siberians up there." Mr. Patten was up on his feet at once, and expressed himself as he did now; that he was only making an intelligent effort to bring out results. They have produced a pomology in the north—why look at Minnesota; it is getting away with us; getting away bad. Why? Because they have got a lot of men there producing varieties in just the same way and by the same efforts that are made by Mr. Patten.

There cannot be too much said of what Mr. Patten and a number of others have been doing in this State along that line. There is no one but what will admit that Mr. Patten has done some things up there that are very interesting, indeed. He showed me one little sample of some of his seedling production when I was up there. It was a beautiful apple; just as pretty as you ever saw hanging.

MR. PATTEN: It was a cross between the Wolf River and Briar Sweet.

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THE PRESIDENT: I will read question 26; it is as follows: "How can the commercial orchardist successfully combat the cherry maggot?" Will Professor Summers please answer the question.

PROF. H. E. SUMMERS: It is presumed that the maggot here referred to is the larva of the plum curculio, *Conotrachelus nenuphar*, which is the insect responsible for most of the wormy cherries in this region. The history of this insect in the cherry and its effects on the fruit are similar to those seen in the plum, excepting that the injury usually causes the plum to drop, while the cherry ordinarily hangs to the tree until ripe. At picking time the nearly full grown worms are found in the cherries. No one remedy alone is successful against this insect. The lines of attacking it are as follows:

(1) Keeping the orchard and all surrounding fence rows thoroughly cleaned of all rubbish in winter, so that the beetles may find no place in which to hibernate.

(2) Spraying with a strong arsenite, preferably arsenite of lime or arsenite of lead, in the early spring before the buds open and at short intervals thereafter, to destroy as many of the beetles as possible before they lay their eggs.

(3) Jarring the trees in the early morning while the cherries are setting, into sheets from which the beetles are gathered and destroyed.

(4) Keeping poultry in large numbers in the orchard, assisting them to find the beetles by jarring the trees in the early morning while the fruit is setting. The poultry must be numerous enough to keep the ground clean to produce the best results.

(5) Keeping all fallen fruit off the ground and destroying all waste fruit at picking time, before the larva can issue from it and get into the ground. Poultry will assist in this likewise.

(6) Destroy all wild plum trees in the neighborhood.

The above treatment must of course also be applied to all plum trees on the place as well as to the cherry trees. To a considerable extent also this is true of apples, in which the plum curculio frequently lays its eggs.

THE SECRETARY: I would like to ask, if stirring the soil during the time and before the beetle emerges from the ground, would, in any degree, lessen or kill the insect?

PROFESSOR SUMMERS: I think that is very useful. There are no definite comparative experiments along that line. Stir-

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ring of the ground is thought to be useful on general principles. As far as I know, there are no definite comparative experiments on this point as regards the plum curculio.

MR. PATTEN: Is it safe to plant a plum orchard and cherry orchard near by?

PROFESSOR SUMMERS: As safe as it would be to plant a plum orchard twice the size.

THE SECRETARY: Will the larvae develop as perfectly in the cherry as in the plum?

PROFESSOR SUMMERS: If the cherry is allowed to stay in the orchard it will, but by picking cherries we market a large share of our worms.

THE SECRETARY: Is that true now with reference to the apple; will as large a percentage come to perfection in the apple as in the plum?

PROFESSOR SUMMERS: Not nearly so large.

MR. BOMBERGER: We have never had any trouble with the curculio in the cherry yet. It seems the cherry is bothered more with the curculio where you have flatter land; but we have no trouble on the bluffs with the curculio.

PROFESSOR SUMMERS: Of course, our western sour cherries which are grown exclusively with us, are very little subject to the attacks of the curculio, compared with what the sweet cherries are. In California, where these sweet cherries are grown, the curculio is the main thing to contend with. It is only under certain conditions, which I do not feel able to describe fully, that the curculio gets into our sour cherries.

The fact is, that the cherries in this state are not, in most of the localities, troubled very much by worms, because we grow almost exclusively the sour cherries.

A MEMBER: How far does the curculio migrate to get on the cherries.

PROFESSOR SUMMERS: The adult beetle curculio is a very feeble flyer; it does not ordinarily go from one orchard to another; I mean the great mass of them won't go even a few rods, perhaps; but while they are flying, certain ones will fly further—wind storms come along and scatter them; but the number that is carried that way is not considerable.

A MEMBER: Do I understand you to say that they prefer the sweet cherries to the sour?

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PROFESSOR SUMMERS: Very decidedly. We sometimes speak of sweet cherries and sour cherries in this State; all our cherries are sour cherries, practically.

THE SECRETARY: Have you noticed any effect from any of the fruit flies?

PROFESSOR SUMMERS: I have not noticed them. I want to say, I do not investigate insects in the State; I really have no opportunity to carry on investigation.

MR. BOMBERGER: I would like to ask Mr. Graham if he has been bothered with the curculio?

MR. GRAHAM: I have been bothered with the maggot, I call it; I thought it was something else than the curculio, from the fact that it never penetrated the seed.

MR. BOMBERGER: The report I had was, where there were level, flat lands, in southeastern Iowa, along the Q; my impression was, it was a different insect altogether.

A MEMBER: I have thought like Mr. Graham, that the cherry maggot was something different than the curculio. I have a row of cherries along the road, quite a distance from any plum trees, forty rods, I should say. These cherries along the road are the only cherries I had bothered with the maggot. But I get the reason for it, that they possibly winter over in the rubbish under the trees. This row of trees has been mulched ever since they were planted, and I think possibly that is the harboring place for them. But I have been under the impression all the time that was something different than the plum curculio.

PROFESSOR SUMMERS: I would like very much to receive specimens this season. There is no appropriation for us to go out and get them. There are several cherry maggots, but the curculio is the only one I have ever found in this State.

A MEMBER: I would like to ask a question a little out of the regular order. What is the value of white walnut timber for posts?

MR. HARRINGTON: I consider it worthless.

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THURSDAY EVENING SESSION.

(Vice President Burnap in the chair.)

THE PRESIDENT: We will have to get to work. If there is no other business to come before the society, we will take up for discussion the list of questions, and it has been thought the better way would be, if it meets with the approval of members, for the chair to read the questions and after they have been read, they might be taken up for discussion. The first question is:

Has dust spraying made any advance the past year?

THE SECRETARY: The answers received to this question would seem to indicate that dust spraying has not been used to any extent in this State.

The advantages of the dust spray are: The ease and rapidity with which it can be applied, and the small cost of an outfit. On the other hand it is claimed that the dust does not adhere so well to the foliage and is less efficient than the liquid spray in controlling fungous diseases.

THE PRESIDENT: Question No. 2. Will it prevent the rotting of plums on the tree?

THE SECRETARY: That point does not seem to be decided. The majority of the answers received express doubt as to the value of the dust spray for plum rot.

MR. REEVES: I cannot understand why it is said that the liquid mixture would be better than dust spraying. We have Bordeaux in the dust as well as in the solution. Another thing, I do not understand why fruit men do not take up spraying more than they do, especially dust spraying. A pound of dust is easily carried and it can be applied in better shape than any solution. Instead of carrying one pound, you put 200 gallons of water in a mixture and go through all that labor. Most of us that have sprayers, do not use them as we should. We have got to waken up; we are almost asleep on this question of spraying; it is very effective; more effective than we want to admit, if properly applied.

Another thing occurs to me. I notice in some of the written answers, the writer states that in wet seasons we cannot spray with dust. Now, that is just when you can use it. You can get out and use it between showers. If you get a few hours

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sunshine or without rain, then you can get in your work with the dust spray, and it proves effective. You can apply the dust a great many times and you can do effective work.

A MEMBER: How much for an outfit?

MR. REEVES: Seven or eight dollars will buy a good outfit.

A MEMBER: What make do you consider best?

MR. REEVES: I do not know what is the best. I have one manufactured by Leggett Brothers, of New York; I think any one who gets that will be satisfied with it. I will say furthermore, that you can insert a pipe long enough so that you can reach up into the trees. A neighbor of mine paid a dollar for a little bellows; he puts the poison in the side of the bellows and blows it into the trees; he has just as good results as anybody can have. With the machine I have, you can have just as many lengths of pipe as you wish. It has a pipe branching out, so that you can apply it to two rows of currants or gooseberries, or anything you wish to.

A MEMBER: I am glad to hear from Mr. Reeves. I think it is either dust spray or no spray at all, because not every one can go to the trouble to make this mixture, sometimes water is scarce and different things are lacking. I think the best spray is the dust spray, if we spray at all.

THE PRESIDENT: No. 3. How should fall and winter apples be kept in cold storage?

THE SECRETARY: Gather as soon as the seeds are colored and the fruit is sufficiently mature, put in tight packages and place in a temperature of 33 degrees. Wrapping the apples with paper will add to the length of time they will keep.

PROFESSOR SUMMERS: I would like to call attention to the fact that from 32 to 34 degrees is the most desirable temperature; so it is simply as close to the freezing point as possible.

THE PRESIDENT: No. 4. Where is the best pear-growing land in the state, and what kind of soil is it?

THE SECRETARY: High ridge land; on clay soil.

MR. GRAHAM: I think the answer covers that question. It is generally known that pears do best on high, clay soil.

THE PRESIDENT: No. 5. What caused the foliage on cherries to drop in July?

THE SECRETARY: Leaf spot, a fungous disease.

THE PRESIDENT: No. 6. What is the cause of strawberries blossoming late in the season?

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THE SECRETARY: A new growth starting after the plants have matured, usually caused by warm, moist weather.

THE PRESIDENT: No. 7. What is the best crop for an orchard eight years old or over. Grass or continuous cultivation?

THE SECRETARY: Continuous cultivation—Grass—Clover—Buckwheat—Cultivation with manure for a mulch. Cultivation alternating with grass or clover, etc., are the answers given.

MR. REEVES: There seems to be about as much difference of opinion, according to the answers read by the secretary, as there would be if you would ask those men who the best woman in the room was.

MR. PIDGEON: I can see wherein all the answers are correct. You will find that it is due to conditions. That test winter we had which killed nearly all our orchards or injured them greatly —my neighbor had an orchard which was kept clean and mine was grown to weeds and grass. The result was, I lost about fifty trees out of 2,000, he lost about two-thirds of all the trees. I do not know what made the difference. He said it was because I had my ground covered.

MR. PRESIDENT: How much pruning should Iowa orchards have?

MR. WRAGG: Just enough to keep the top well opened out to let the sunlight and air in, avoiding large scars. A man must have an ideal in his mind. When you put out a two-year old tree, you have got to know that in a few years they will spread out; you have to notice when the limbs are interfered with. I would keep the knife out of a cherry tree.

A MEMBER: Do you recommend a low or high top?

MR. WRAGG: A low top.

THE PRESIDENT: No. 9. The average per cent of stand of plum seedlings raised from one bushel of American Plum pits?

THE SECRETARY: Only a few answers to this question; 1,500 to 7,000; 35 to 90 per cent, according to treatment given.

THE PRESIDENT: No. 10. Best stock for budding Americana plums, Miner root cuttings, or Americana seedlings?

THE SECRETARY: The answers to this question seem about equally divided between Americana and Miner.

MR. HARRINGTON: Do not some of the Americana seedlings sprout more from the roots than the Miner do?

MR. REEVES: I do not think they do. I have Miner sprouts coming up all over the nursery rows.

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MR. HARRINGTON: My experience in my own orchard is, that some of the trees of the Americana sprout very much worse. I think there is quite a difference in the seedlings of the Americana.

THE PRESIDENT: No. 11. What success have you had with Rathbun blackberry?

MR. HARRINGTON: With me, in central Iowa, it always freezes to the ground.

MR. GRAHAM: That is my experience.

MR. REEVES: It froze dead with me the first year.

MR. HARRINGTON: Over in central Iowa it sprouts up very finely in the spring; makes quite a growth and that is all. I do not consider it very good.

THE PRESIDENT: No. 12. The use of sand or sawdust for packing grafts—the best and why?

MR. WRAGG: I think under ordinary conditions, where we have got it handy, pure sand is the best to use. Where you are used to handling it, old sawdust is very good.

MR. SNYDER: I use altogether for packing grafts old sawdust; that is the best thing I can get.

MR. HARRINGTON: I believe the novice better use sand. With sawdust you have got to be very careful about letting the stock sprout too early.

MR. REEVES: I like moss better; it keeps it cool in the spring.

MR. GRAHAM: I would use cottonwood sawdust cut fresh from the green logs; it keeps the temperature down so it does not heat.

THE PRESIDENT: No. 13. The success in cutting back one year grafts, and what height obtained by second years growth?

MR. WRAGG: This year we cut all ours off; had 150,000, we cut them all off. Ten years ago we had a block of trees injured by rabbits; we got at them and cut them all off. They were varieties of the Northwestern Greening, the Walbridge and a whole lot of varieties. They were all four or five feet tall; we topped them the next year and had splendid, nice, uniform trees.

MR. REEVES: Farther north we hardly get as strong growths as that. I always cut in the spring; never cut in the fall. I like the plan very much if I could get a good growth the first year.

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MR. HARRINGTON: I do not know why Mr. Reeves should have any objections for cutting them off in the fall. If he would cut them in the fall and then ridge them over with a small plow, he would have perfect protection in the winter; and uncovering them then you will always find the top bud in perfect condition. I have seen that method used exclusively in the nursery at Iowa City. You can get finer trees, two years' top and three-year-old root, than by any other plan I have used.

MR. BURNAP: How soon, Mr. Wragg, did you trim them?

MR. WRAGG: We let them make a growth of two or three inches, until along about May 1st, may be a little later. Then you take them all off but one, but you want to be sure of that sprout.

THE PRESIDENT: No. 14. What is the cause of the black color on apples, especially Northwestern Greening?

PROFESSOR PAMMEL: I thought I would defer two or three questions I expect to answer in connection with what I have this evening. That particular one is as to the widely distributed fungous trouble, just like the apple scab. It is not especially distructive, except that it makes the apple what you might call unsaleable. It is not anything injurious like the apple scab; it is a superficial fungus. Somebody worked it out a few years ago and found spraying with Bordeaux mixture would prevent it entirely.

THE PRESIDENT: No. 15. Will trees that bore scabby apples this year bear scabby fruit next season, if not sprayed?

PROFESSOR PAMMEL: I think it would be a very wise thing, indeed, to spray orchards very thoroughly this year. The more scab is started, the more you will have next year. The abundance of the scab depends a little upon the favorable conditions next year. But I am satisfied that all of our fungous troubles have largely increased, because of the lack of attention to spraying and hygienic conditions. I know this to be a fact with reference to the cherry disease. I can take you to cherry trees in Story county and show you trees that had very little fungous trouble this year, and then again, the same variety, because of lack of proper attention, cleaning up the orchard and spraying the year before, were suffering very much.

MR. WRAGG: I was in the State of New York two years ago, and visited a very large orchard and found the fruit scabbed to such an extend that it was absolutely unmarketable. The man, in talking to me said that he thought the fruit interests in west-

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ern New York were simply doomed. I was back there this fall in the same orchard, and I never saw finer apples in my life; you could not find a scab; the same orchard, just loaded with 30 or 40 bushels to the tree; you couldn't find a scabbed apple on them.

MR. HARRINGTON: I would answer that question, most decidedly; there will be more likelihood of scab the next year, unless attention was paid to spraying.

THE PRESIDENT: No. 16. Can a fruit tree be safely judged of its hardiness by the ripening of leaf, wood and general appearance?

PROFESSOR PAMMEL: I will just say a word in regard to that. I think some years ago, before the Horticultural Society, I published a paper on that problem; quite a number of other people have taken up the same question. I think Captain Speer was a great advocate—you know he always thought when the wood was thoroughly ripened, you could see something about its hardiness. I may say that by microscopical examinations by Dr. Halstead and some that I made, that the riper the wood, the better the tissue will in a measure form the hardiness of the tree. I think in the Fulton variety, which is a tender variety, the wood of that tree was not properly ripened, and there was a difference in the texture of the fabric of the plant. Of course, I am just throwing these out as general remarks.

MR. GRAHAM: Do I understand you refer to the Fulton apple?

PROFESSOR PAMMEL: Yes, sir.

MR. GRAHAM: I know a Fulton tree 40 years old, as hardy as can be.

MR. REEVES: I would remark right on that point, that many varieties seem to be quite hardy when they attain age, that are not hardy in the nursery. The Northwestern Greening, we were afraid for a long time, that wasn't as hardy as it really was, because it seemed to shed its leaves in the fall. We have found, while it did that, it has peculiarities that largely overcome that condition. It ripens the leaves and still it holds them; it is a sort of a fuzzy formation over the edge of the branch that will protect them largely, while the wood ripens up smoothly.

MR. WRAGG: I would like to ask if it is not true, that you can to a certain extent pick out the hardiest seedlings by the foliage ripening?

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MR. REEVES: You can to a certain extent; but it is not conclusive; in one year it might ripen later, while the next year it might not do so.

MR. SECOR: You can not always tell by the falling of the leaf whether the tree is hardy. Some of our hardiest trees hold their leaves perfectly green until it freezes.

MR. BLODGETT: We had one of our best peach crops in Henry county, the fall before the leaves were frozen on the trees, but it thawed enough to let them drop off, and where some of the buds yielded to the temperature easiest, the leaves would fall quite early.

PROFESSOR PAMMEL: It is a fact, if you make some observation along the line Miss King has made, that a large number of our semi-hardy plants keep their leaves later than the hardy plants. Now, I have been interested in that; you can cite a great many illustrations.

PROFESSOR LITTLE: It is quite a noticeable fact in the plums. Take the Wild Goose variety. The Nigra varieties drop their leaves before the Americana and the Americana next and then the Wild Goose, and then the Wayland group, that is still more tender, do not drop their leaves until very late.

JOHN FORSTER: Take our native wood, the white oak, has its full foliage late in the fall, and it is one of the hardiest timbers we have. Would not the same thing be true with our fruit trees, or would it not?

PROFESSOR PAMMEL: The leaves are dead; they are not living leaves.

JOHN FORSTER: Why is it they hold on? I am asking for information. I live in a wooded country.

PROFESSOR PAMMEL: The leaves are dead.

MR. SECOR: The willows all hold their leaves green after all the other trees have shed them; the willows are hardy.

PROFESSOR PAMMEL: I do not state this proposition as an invariable rule; simply as a general fact.

THE PRESIDENT: No. 17. Is deep planting of fruit trees better than the ordinary depth trees are generally planted?

MR. HARRINGTON: I think that depends wholly on conditions. On sandy soil or on bluffs, or perhaps even western drift soil, I would plant much deeper than in clay soil. If I were planting in the southern part of the State, I certainly would not plant deep.

MR BURNAP: State what you consider deeper.

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MR. HARRINGTON: On the soil where I live I would plant four or five inches deeper than they stood in the nursery.

MR. BURNAP: If you were in sand, how deep would you plant there?

MR. HARRINGTON: Not less than eight inches deeper than in the nursery. I know of trees planted twelve and fourteen inches deeper than they originally stood and they are doing finely on second bottom.

JOHN FORSTER: That question was discussed in the South-eastern Society meeting. believe that one question left more confusion in the minds of our people than any other one. I believe it was advocated from two feet to eight inches. I understood many did not understand it and many inquiries have been sent out since; we have to take into consideration the different soils altogether.

THE PRESIDENT: No. 18. What have been the comparative merits of liquid and dust sprays during the past year?

MR. REEVES: I might say, there may be some places where the dust spraying was not as good as liquid, but as a rule I have no use for liquid spraying.

MR. HARRINGTON: Down in Missouri, where they have been testing the matter, I think the concensus of opinion is, that liquid spraying is preferable; that is more efficacious. I think a large proportion of commercial growers yet prefer liquid spraying.

THE PRESIDENT: No. 19. What are the three greatest hindrances to successful orcharding and fruit growing and the remedies?

Let the secretary read the answers received to this question.

THE SECRETARY: I will give you a summary of them. The remedies are suggested, if the answers are correct.

Lack of hardiness in winter varieties of apples. Too many summer and fall varieties planted. Overstocking the markets with small fruits. Lack of co-operation in marketing. Insects and fungous diseases. Poor selection of varieties and soils on which to plant them. Misrepresentation on the part of salesmen of nursery stock, and lack of care on the part of the planter.

THE PRESIDENT: No. 20. Is it possible to keep trees and plants in storage cellars over winter and have them in as good condition in the spring as are trees and plants that have stood in open nursery?

MR. WRAGG: That would be just like asking a dairyman whether he could have a nice Jersey cow by tying her up to a

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post all winter without any protection, and that she would give just as much milk as one that was taken care of in a barn. It is just the same with your tree. If you are going to transplant a tree, dig it up and put it in a cellar, keep it there under proper conditions, and it comes out in the spring, vigorous—where the root has been cut, it is healed over and it will take hold of the soil and growth commences at once.

MR. BURNAP: Occasionally we get trees that have been wintered in the cellar and they do not start for a long time; what is the cause of that?

MR. WRAGG: They have been kept in a wrong temperature. Under proper conditions that tree certainly will come out.

MR. REEVES: The thought that suggested itself to me is, that a great deal of the cellar stored stock is not properly stored and cared for during the winter, and that is where the difficulties come in, when it does not start properly in the spring.

A MEMBER: What temperature should they be kept in?

MR. HARRINGTON: I believe the ideal condition would be to just let them freeze a little, and hold them there until spring ready for planting.

THE PRESIDENT: No. 21. Has not mulching young trees proven, where tried, better than clean cultivation of the young orchard to withstand both root-killing in winter and drought in summer?

A MEMBER: I never tried mulching trees; it would be too expensive for a large orchard. I think for a commercial or large orchard, the only thing to do would be to cultivate it.

MR. SECOR: I would be afraid of it from the fact that it would cause the roots in a year or two to come too near the surface.

MR. HARRINGTON: Where the trees are all established, the roots deep enough, the question of mulching later on, conserving the moisture proper, can be very successfully met by mowing the grass. This, of course, has reference to a young orchard.

THE PRESIDENT: It is nearly 9 o'clock, and we must now draw the program to a close, if that is the wish of the society, and proceed with the lecture by Professor Pammel, entitled, "Fungus Diseases of Plants."

Upon motion the program was drawn to a close and Professor Pammel delivered his lecture in connection with stereoscopic illustrations.

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[Copy of paper not received.—SECRETARY].

The following is a summary of the answers received by mail, which were not answered at the meeting:

Question No. 22. Should not nurserymen spray young cherry trees for leaf blight before selling them to customers?

Answer. If the trees are affected with leaf troubles in the nursery they should be sprayed to remove the trouble from the growing trees, but no farther spraying would be necessary.

Question No. 23. What has been your experience in cold storage of grapes?

Answer. They can be kept from six weeks to two months in cold storage. Not many stored in the State.

Question No. 24. What are the best varieties of Russet apples for northern Iowa?

Answer. The English Golden Russet and Perry Russet are generally mentioned, but the former is not considered productive, and neither variety is entirely hardy.

Question No. 25. How do aphis winter, and why are there so many so early in the spring?

Answer. The aphis winter in the egg; these are laid on the twig, usually near the buds; they hatch in the spring. A generation can be raised in about ten days, under favorable conditions.

Question No. 26. See afternoon discussion.

Question No. 27. See afternoon discussion.

Question No. 28. Does topworking a tender variety on a hardy stock add to the hardiness of the tender variety?

Answer. It is difficult to prove, but many growers are of the opinion that it does.

Question No. 29. Does topworking a hardy variety on a tender stock add hardiness to the stock?

Answer. The same answer as to the preceding question. Though the number who believe in the influence of the scion on the stock is less than with the stock on the scion.

Question No. 30. Has there been any advance made in securing hardiness in peaches in the last fifteen years, or any other fruit?

Answer. The increase in hardiness of varieties is perhaps not measurable, but there has been some advance in the selection of varieties better adapted to Iowa conditions.

Question No. 31. Is there a prospect that hardiness could be added to fruit trees, such as apple, plum and cherry by a

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judicious selection of seed from which to grow stock on which to graft?

Answer. The answer seems to be in the affirmative, though opinions differ in regard to it.

Question No. 32. What can be sown in the orchard in the late summer that would be preferable for a cover crop?

Answer. Buckwheat, oats, cow peas, corn, rye, rape and hairy vetch were mentioned in the order named.

Question No. 33. Should we head trees low; how high?

Answer. The answers range from eighteen inches to four feet, with the larger number at about three feet.

Question No. 34. Name the three best evergeeens for ornament? For windbreaks?

Answer. For ornament, Colorado Blue Spruce, White Pine, and Arbor Vitae. For wind-breaks, Austrian Pine, Scotch Pine and Red Cedar.

Question No. 35. Name the five best deciduous trees for ornament. For shelter belts?

Answer. Cut-leaf Birch, Hard Maple, White Elm, Linden, White Oak. For shelter belts, Soft Maple, White Willow, White Ash, Russian Mulberry, Cottonwood.

Question No. 36. Which are the three best early plums for southern Iowa? For northern Iowa?

Answer. For the south, Wild Goose, Forest Garden, De Soto. For northern Iowa, Forest Garden, De Soto, Wyant.

Question No. 37. The best late plums for southern Iowa. For northern Iowa?

Answer. For the south, Miner, Weaver, Hawkeye. For the north, Miner, Wyant, De Soto.

Nos. 36 and 37 would be better answered in this manner. For early, Wild Goose in the south half, and Forest Garden in north half of the State. For mid-season De Soto and Wyant, and for late, Miner.

Question No. 38. Name the three best summer apples for southern Iowa. For Northern Iowa?

Answer. For southern Iowa, Duchess, Yellow Transparent, and Benoni, in the order named. For northern Iowa, Duchess, Yellow Transparent and Tetofsky. Next to these in popular favor are, Lowland Raspberry and Whitney No. 20 at the north, and Red Astrachan in the south half of the State.

Question No. 39. The three best fall apples for southern Iowa. For northern Iowa?

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Answer. Wealthy, Fameuse and Longfield in the south half; and Wealthy, Longfield, and Plumb's Cider at the north; following these are Patten's Greening and Fameuse.

Question No. 40. The four best winter apples for southern Iowa. For northern Iowa?

Answer. Jonathan, Ben Davis, Grimes' Golden and Northwestern Greening, Next in favor are Genet, Winesap, Roman Stem and Willow Twig.

After naming the Northwestern Greening as the leading sort for the northern district, orchardists do not agree very well on the other three varieties. Ben Davis, Malinda and Walbridge are among those most frequently mentioned for second, third and fourth place.

Question No. 41. What variety of pears should we plant in Iowa?

Answer. Kieffer seems to be the standard variety.

Question No. 42. Name the three best red raspberries for planting in this state?

Answer. Loudon, Turner, Cuthbert, with Miller and Columbian as next in favor. In the northern half the order is reversed: Cuthbert, Loudon, Turner, with Columbian and Miller as second choice.

Question No. 43. The three best black raspberries?

Answer. Gregg, Kansas and Older, with Cumberland next in favor at the south. At the north the order is changed to Kansas, Older, Gregg, with Cumberland, Nemaha and Helborn as second choice.

Question No. 44. What is your experience with beech trees in Iowa? With the Ginko?

Answer. The beech is tender. The Ginko seems to be hardy in the eastern half of the State. Not many planted as yet.

Question No. 45. At what age is it best to top-work apple, plum and cherry trees, and at what time in the year should it be done?

Answer. The answers range from one to six years after the trees are set in the orchard. Graft in March, or about the time the buds start. Bud from May 20th to June 15th, or when the bark will slip easily. The age of the tree does not limit top-working, though it may not be profitable to top-work very old rees.

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FRIDAY, DECEMBER 11, 1903.

BOARD MEETING.

The board of directors met in the room of the society at 9 o'clock, on Friday morning. All the members and officers were present except J. S. Trigg, of the Eleventh district.

The bills for the expense of the society during the year were presented, audited and approved by the board.

The resolution in regard to the joint program of the different societies, Horticultural, Park and Forestry and Farmers' Institute, was taken up and upon motion was referred to the executive committee with power to act as it deemed best.

The resolution relating to the establishing of a permanent registry record of new fruits was taken up and considered; after some discussion the resolution was laid on the table.

The rules for 1904 were taken up and gone over section by section. The rules were then approved as amended.

Prof. A. T. Erwin was elected a member of the supervising committee for two years, to fill the vacancy caused by the resignation of Prof. H. C. Price. Mr. C. G. Patten was elected a member of the committee for three years.

The following committee on legislation was chosen for the ensuing year:

C. L. Watrous, Eugene Secor, Silas Wilson, Wesley Greene and M. J. Wragg.

The following resolution pertaining to the committee on Legislation was read and adopted:

Resolved, That the committee on Legislation be instructed to use their best efforts to secure favorable legislation as follows:

First—For an adequate Pure Food Law.

Second—For such amendments to our present nursery quarantine law as the state legislature may deem necessary for our protection, and that a suitable fund be asked for its enforcement.

Third—That the committee co-operate heartily in the effort to secure a reasonable addition to the present appropriation for the World's Fair at St. Louis.

On motion, $400, or so much as may be necessary, was placed at the disposal of the secretary for the purpose of publishing bulletins for the year 1904.

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On motion, $25, or so much as may be necessary, was appropriated to bind the bulletins now in the library.

On motion, $100 was appropriated for the purchase of books for the library.

On motion, $50 was appropriated toward paying for printing of the second annual report of the Park and Forestry Association.

On motion, $500 was appropriated for contingent expenses of the Secretary's office.

On motion, the salary of the secretary was fixed at $1,200 for the ensuing year.

On motion, $195 was appropriated to pay premiums on exhibits of fruit at the next meeting.

The board adjourned at 11 A. M.

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PROCEEDINGS

OF THE

SOUTHEASTERN IOWA HORTICULTURAL SOCIETY

HELD AT

ALBIA, IOWA, NOVEMBER 18, 19 AND 20, 1903.

THIRTY-FOURTH ANNUAL SESSION.

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LIST OF OFFICERS FOR 1904.

PRESIDENT.

Wm. Langham ..... Cedar Rapids

VICE PRESIDENT.

S. B. Dewey ..... Washington

SECRETARY.

W. T. Richey ..... Albia

TREASURER.

F. O. Harrington ..... Williamsburg

DIRECTORS.

First District—W. S. Fultz ..... Muscatine
Second District—S. W. Snyder ..... Center Point
Third District—Abner Branson ..... New Sharon
Fourth District—C. G. Blodgett ..... Mount Pleasant
Fifth District—John Forster ..... Albia
Superintendent of Exhibits—Rolland Sherburne ..... Lone Tree

Place of meeting, Lone Tree, November 16, 17, 18, 1904.

STANDING COMMITTEE ON SEEDLING FRUITS.

C. E. Deuel, First District; H. Harrington, Second District; Abner Branson, Third District; C. G. Blodgett, Fourth District; and H. B. Moore, Fifth District.

DISTRICTS.

First District—Jones, Jackson, Clinton, Scott, Cedar and Muscatine Counties.

Second District—Story, Marshall, Tama, Benton, Linn and Johnson Counties.

Third District—Polk, Jasper, Poweshiek, Iowa, Marion and Mahaska Counties.

Fourth District—Keokuk, Washington, Louisa, Jefferson, Henry and Des Moines Counties.

Fifth District—Monroe, Wapello, Appanoose, Davis, Van Buren and Lee Counties.

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LIST OF MEMBERS.

LIFE MEMBERS.

Baumhoefner, A. J. ..... Williamsburg
Bills, F. L. ..... Davenport
Blodgett, C. G. ..... Mount Pleasant
Branson, Abner. ..... New Sharon
* Bruner, D. F ..... Toledo
Dewey, G. B. ..... Washington
Deuel, Chas. E. ..... Washington
Forster, John ..... Albia
Fultz, W. S. ..... Muscatine
Fye, J. W ..... New London
Greene, Wesley. ..... Davenport
Harrington, F. O. ..... Williamsburg
Harrington, Millard ..... Williamsburg
Harrington, Hugh ..... Williamsburg
Hinds, R. E. ..... Ottumwa
Lutton, T. J. ..... South English
Michener, H. H. ..... West Branch
Porterfield, D. A. ..... Traer
Richey, W. T. ..... Albia
Russell, C. A. ..... Mediapolis
Snyder, S. W. ..... Center Point
Tatum, Elwood. ..... West Branch

HONORARY LIFE MEMBERS.

Burton, Miss Helen M. ..... Cedar Rapids
Goodspeed, M. ..... Washington

HONORARY MEMBERS.

Prof. A. T. Erwin ..... Ames
Prof. R. B. Spencer ..... Albia
Prof. H. C. Hollingsworth ..... Albia
Mrs. Nellie Gregg Tomlinson ..... Albia
Mrs. Clara Gregg Bock ..... Albia
Miss Lelia Fuller ..... Albia
Miss Mable Lyman ..... Bussey

* Deceased.

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ANNUAL MEMBERS.

Ayres, H. F ..... Wilton Junction
Barger, John P ..... Columbia
Bezdek, Wesley ..... R. F. D. No. 1, Cedar Rapids
Bemer, Love ..... R. F. D. No. 1, Cedar Rapids
Bowers, John ..... Sigourney
Bernhardt, Paul ..... Homestead
Clark, W. P ..... Albia
Dice, J. S ..... R. F. D. No. 2, Cedar Rapids
Eden, Geo. W ..... Lone Tree
Fourt, Dr. Frank ..... Fairfield
Goodnow, Frank ..... Marion
Graham, N. S ..... Albia
Haas, Joseph ..... Kenwood
Hoaglin, J. L ..... Mount Pleasant
Henecke, Edward ..... Cedar Rapids
Hindman, J. C ..... Avery
Langham, Wm ..... Cedar Rapids
Laughlin, J. L ..... Mount Pleasant
Mason, W. H ..... Cedar Rapids
Mason, A. A ..... Albia
Mason, D. N ..... Albia
Moore, H. B ..... Albia
Moore, John ..... Box 157, Albia
Mercer, Wm ..... Albia
McDowell, C. B ..... Seymour
McGilvery, J. A ..... Albia
Obersmeyer, J. C ..... Albia
Payne, J. W ..... Albia
Perrin, Loreny ..... Albia
Robeson, J. C ..... Albia
Rowles, W. A ..... Albia
Rodgers, Ben ..... Frederick
Stewart, C. H ..... R. F. D. No. 2, Cedar Rapids
Shipley, T. B ..... Albia
Stone, C. H ..... Muscatine
Thompson, J. W ..... Mount Pleasant
Trussell, W. H ..... Moravia
Tanner, T. C ..... Covington
Vannoy, A. M ..... Blakesburg
Wolff, P. A ..... Cedar Rapids
Wright, G. G ..... Centerdale
Wilson, John L ..... Centerville
Woodward, J. W ..... R. F. D., Albia
Watson, A. C ..... Albia
Edmundson, I. N ..... Thornburg

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PROCEEDINGS OF THE

Thirty-Fourth Annual Meeting

OF THE

Southeastern Iowa Horticultural Society,

HELD IN

Albia, Iowa, November 18, 19 and 20, 1903.

MORNING SESSION—FIRST DAY.

The Society was called to order by the President, Wm. Langham, who called the Vice President to the chair.

VICE PRESIDENT: According to our program the first thing will be the annual address of the President.

PRESIDENT'S ANNUAL ADDRESS.

Ladies and Gentlemen, and Members of the Southeastern Iowa Horticultural Society: I congratulate you on the auspicious circumstances under which we convene in this our Thirty-fourth annual session, and I fervently invoke that spirit and measure of wisdom, earnestness and harmony in its deliberations, which have characterized the past.

Horticulture in southeastern Iowa is no longer a dream, or even an experiment. It is an accomplished fact, and I believe that I may justly claim that there is no department under the broad term Agriculture, which has made greater progress, or is on a firmer or surer basis.

More than forty years ago when I first came to Linn county, horticulture was in its infancy. I knew of but one man who had a few grapevines in

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his garden. Orchards were few in number, small and far between. Ornamental shrubs were rare indeed, while flowers were for the most part annuals—good old kinds and dear to memory to be sure. But today I can point to a thousand orchards, vineyards, small fruit farms, and model gardens on hill and in valley, and on wind-swept prairie. Ornamental shrubs and vines, and the choicest plants and flowers emparadise many of our homes, an inspiration to the higher and nobler qualities and impulses of the human mind and heart. I have no doubt a like condition in a greater or less degree prevails over our entire territory. While wealth and culture which have come with the years can justly claim a share in bringing about this great change, yet I am vain enough to think and believe that greater meed of praise and glory rightfully belongs to the efforts and influences of our society. But have we reached the goal? Shall we rest on the laurels won in the past? No, the work must go on. We have but fairly gained the threshold of possibilities. While it has been demonstrated that we have a soil suited to every demand of horticulture, we have climatic conditions, severe, varied, and somewhat erratic. To adjust ourselves to these conditions is the *one* great problem. True we have insect enemies and fungous diseases in abundance, but as laymen we may confidently leave this part of the battle to our doctors or rather professors at our various Agricultural Colleges and Experiment Stations. And I want to say in commendation that they are giving our foes a hard fight, and in the end, I believe, will come off victors.

Lest we forget what the founders of our organization had in view let me call your attention to Article 2 of our Constitution. It reads thus: The object of this society shall be the promotion and encouragment of horticulture, arboriculture, and floriculture by the collection and dissemination of correct information concerning the cultivation of such fruits, flowers, plants, and trees as are adapted to the soil and climate of southeastern Iowa. We meet in these annual sessions to carry out the spirit and intent of that article. We meet to collect facts, and to map out work along certain lines for the future. We meet to exchange ideas and knowledge, particularly that knowledge which comes through experience and observation. In short our annual meetings are a sort of clearing-house of horticultural information.

Now for the special benefit of those who have met with us for the first time, let me in a homely way paraphrase or put Article No. 2 in different language, as regards its practical applications. If you desire to engage in the culture of tree fruits, such as apples, plums, pears and cherries, we have specialists who can tell you all about them—their propagation, care and management, from the buds or grafts to the full-grown orchard. If you wish to go into the peach industry, we have men here who have been through the whole thing, and can talk "peach" till your mouth will water in anticipation. If you desire to plant a vineyard, or establish a small fruit farm, we have those here who have had many years experience along those lines, and that experience is worth dollars—*to you*. If you would set out or propagate shade, or ornamental trees or shrubs, or flowers, or vines, we have members who can safely lead you along the devious way to certain success. If you have "bugs" or fungi we have scientists and professors with us who can give you the "latest" on those ever present scourges of the vegetable kingdom.

This has been a year of grumbling and fault-finding with most people. It has been too wet and it has been too cold. It *was* a trifle wet at times,

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and the thermometer was not given to lofty flights, yet I have noticed that those persons who sowed and planted at the right time and in proper soil have received a generous reward for their labor. Our various fruits have come to maturity about the usual time, and while the yield was not quite up to normal figures, the prices were exceedingly satisfactory. It seems to be a wise plan for each one to do *his* part well, faithfully and in hopeful reliance, and let Providence take care of the rest. As for myself I have grown optimistic, so far at least as concerns the weather. Every shower has been prophetic of future success and prosperity. There was a time when I saw our fruit trees and vines and even the oaks and hickories and other forest trees dying by hundreds because of droughty seasons that I began to feel that we were drawing dangerously near to the boundary lines of the "Great American Desert" of our early geographies, but happily those years have gone, I hope forever.

It is customary for the presiding officer of this society in his annual address, to make suggestions as to such matters as seem important and worthy of especial attention. When it became evident that I would have to perform that function at this meeting, I carefully read over the many excellent addresses of my predecessors, and I found that they covered the whole ground; so it is only left for me to repeat a few of the many good things already said and recommended in the past.

In my judgment the recommended fruit list should be most carefully made up. Planters consult that list, and are guided by it; and it should be made worthy of their entire confidence.

Although we have experiment stations, we should encourage private enterprise on that line. There has often been a chance discovery which has revolutionized existing conditions.

I believe that we should always have an accredited representative at the meetings of the State Horticultural society at Des Moines. And, farther, I believe that person should be our secretary. You can easily see the reason. Such attendance would put him in touch with the prominent horticulturists of the *whole* state, and his means of information would be easily increased. All this would fit him the better for his duties as secretary in the preparation of the various papers and reports which he is required to make.

Our seedling committee should be continued and every one belonging to our society should be made an honorary member. Let us look after the seedlings. Nature sometimes has in store for us a great and valuable surprise.

We should make greater efforts to increase the membership of our society. Why, the Southeastern Horticultural Society ought to have several hundred names on its list. Let each one do a little missionary work for the coming year. I believe the results will be most gratifying.

Again death has laid his heavy hand upon us and decimated our ranks. Two of our oldest, ablest and most highly respected members, H. W. Lathrop, of Iowa City, and C. W. Burton, of Cedar Rapids, have joined the silent majority. I would recommend that this society by appropriate resolutions, spread upon the records, express their deep sorrow and irreparable loss in the death of these two distinguished horticulturists.

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SECRETARY'S REPORT.

BY W. S. FULTZ, MUSCATINE.

The spring of 1903 opened somewhat earlier than usual but the weather was wet and cool and fruit trees came into bloom quite slowly. Plum trees came into bloom from April 12th to 26th, and cherry trees from April 23d to 26th, while apple trees opened their first bloom from April 23d to 29th. On the morning of May 1st we had frost with the mercury two degrees below freezing, but this did not seem to affect the fruit bloom. So far as my knowledge goes there was less injury from insect depredations during the past summer than usual, but fungous diseases were more prevalent than usual. The continued wet weather probably had much to do with these pests of the orchard. This is a matter of congratulation as well as an evidence that we are making an advancement in horticulture to know that there has been no sweeping destruction of our orchards for about twenty years. Securing more hardy varieties with a better knowledge of how to properly care for our orchards is making orchards and fruit plantations more plentiful in southeastern Iowa.

That the proper care of an orchard has much to do with its longevity as well as its bearing qualities is a fact too potent to be overlooked and the proper care of an orchard is one of the things that this society should seek to impress on the public as well as upon its own members.

It is a matter of congratulation that this society in its efforts to broaden its sphere of usefulness has been successful. We have been holding our annual meetings in widely separated localities and we believe that our efforts to encourage the planting of orchards and fruit plantations in all parts of our extensive territory, and to disseminate a knowledge of horticulture in all of its branches, has been eminently successful.

One of the fundamental principles of this society is to encourage horticulture in southeastern Iowa by collecting and disseminating correct information concerning the cultivation of such fruits, flowers and trees as are adapted to the soil and climate, and to do this is the object of our annual meetings. Many of the members of this society are carrying on extensive experiments on their own grounds and the results of these experiments are freely given to the public at our annual meetings.

Since our last meeting one of our life-long members and one of the founders of this society has gone to his reward. A great light in our horticultural work has gone out. It is with sincere sorrow that I announce the departure from this life of Henry W. Lathrop. He has gone where the flowers are ever blooming and where the fruits of the heavenly Eden are growing in perfection. No man who has ever been connected with the society will be missed more than H. W. Lathrop.

DIRECTORS' REPORTS.

From the directors' reports I find that the percentages of yield were as follows: Strawberries, 90 per cent; Raspberries, 75 per cent; Blackberries, 80 per cent; Apples, 30 per cent; Pears, 10 per cent; Peaches, 40

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per cent; Plums, 50 per cent; Cherries, 20 per cent; Grapes, 100 per per cent. Taking the whole of the southeastern part of Iowa it may be said that all kinds of berries were large and fine and of splendid quality and that prices were well sustained during the marketing season. Grapes were of good quality with an average yield and fair prices. Pears were a very short crop, but the quality was rather above the average. Plums were almost a failure, except as to Americana and the little Blue Damson, which were an average crop, the fruit being in most cases large and fine. Seedling peaches did fairly well, but budded varieties were a failure. Of apples it can be said that about every known enemy both insect and fungus asserted itself. In many localities the late spring frost injured the blossoms and the result was a crop in which few apples would be rated as first class, the balance being a scabby, wormy, sorry lot. The Wealthy, Genet and Allen's Choice were an exception, they being better than most other varieties. The prices of apples were well sustained, considering the poor quality of the fruit.

In most localities the planting of trees, vines and small fruits has been as extensive as usual and the growth has been good. The prospects for a good crop of all kinds of fruit for next season is excellent and the outlook in that line is all that could be desired.

Owing to the continued rains last spring but very little spraying was done. The director of the first district reports some spraying done with the use of the dust process which was apparently very successful.

Since arriving here to attend this meeting I have been informed of the death of our long time and very efficient secretary, C. W. Burton, and also of the death of Isaac Schooley. Both of these were old members of our society and will be greatly missed at our future meetings.

Realizing that the infirmities of age are growing on me so that I can no longer continue to perform the duty of secretary and thanking the members of this society for their kindness and good-will toward me during the short time that I have served them as secretary I ask to be relieved from further duties in the office.

OUR FRUIT CROP THE PAST SUMMER.

BY B. A. MATHEWS, KNOXVILLE.

The season just past was a trying one to the fruit grower. The apple trees yielded a very light crop of inferior fruit. Cherries about half a crop. Native plums very light again, but Domestic sorts very much better. The crop of Domestics would have been immense if a person could have sprayed to any advantage. At a critical time it rained for eight days in succession allowing the orchardist no opportunity to get in any work in this direction. Yet in spite of this the output was not a bad one. The eight days rain above mentioned, commenced about half past 10 o'clock in the forenoon. Up to that time I had sprayed thoroughly a portion of my plum orchard. This portion bore considerably more fruit than the rest of the orchard, although it was composed of about the same varieties. It furnished a fine object lesson. This was the fifth time I had sprayed but every time a rain

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followed closely except after the two sprayings given before the trees blossomed. Although plums were very scarce, they rated low in the markets. First-class Green Gages, Spauldings, Moore's Arctics, Lombards and other kinds consigned to Des Moines commissionmen, sold in that city to their customers for about seventy cents per half bushel. During the state fair, with some other fruit growers, I went to leading Des Moines houses dealing in fruits. There were no Iowa plums in the market except what were received from Knoxville. These were Blue Damsons and were retailing at three dollars per bushel. Now when it is taken into consideration that these plums were being bought in Knoxville at one dollar per bushel it can be seen that some one beside the grower was getting the profit. A matter of this kind should set orchardists to thinking. I cannot help believing that California fruit raisers would manage in one way or another, to beat a little game like this.

During the early part of the spring the outlook for pears was all that could be desired. With me, the trees were hanging wonderfully full of small fruits which were frozen solidly when the cold storm came. Within a few days the dropping process began and soon the outlook which a few days before indicated a thousand bushels or more, began to remind me of the proverbial 30 cents. However, the samples were fine and the demand first rate. A year ago last summer the blight in the pear orchards was the worst I have known. The same may be said of it in nursery, especially among the apple trees, which was the second time this blight has occurred in nurseries in this locality. During the present season the pear trees in orchards have righted up and now give promise of a remarkable yield next summer.

The blight, like the poor, I suppose will always be with us, although once I got along for eighteen years without its putting in an appearance in my pear orchards. Probably I had sixty varieties of this fruit in bearing this year and without exception the specimens were fine, being entirely unlike the apples in this respect.

The leaf-spot disease among the cherry trees the past two years has been unusually severe. Indeed, many large orchards have been ruined and others will be badly used up should the present winter prove to be a trying one. It looks as though this disease cannot be ignored any longer in the cultivation of this fruit. Possibly it will be to the cherry what the blight is to the pear. I noticed some of the effects of this disease on the Kieffer pear, not enough to do any particular harm, however, though I read of its working great mischief in the East. It may prove to be a bad boy in our horticultural school and requires close watching.

I am making arrangements to test the dust spraying another year. If there is anything in this we should know it. It would seem as though the dust could be applied better during wet seasons than could the liquids. Then again it can be used early in the day while the leaves are wet, hours before other sprays are available.

The peach trees gave us about 40 per cent of a crop with more cracking and rot than heretofore. Peaches are being put out by the thousands in this county. Many planters are setting large orchards of both peaches and pears. The peach and pear questions are discussed almost as much as any other matters in regard to fruits.

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The persimmons were loaded until the branches laid on the ground. The fruit sold readily although it was not quite up to the average in size and quality.

MR. EDEN: I would like to know what is the cause of this blight?

MR. WATROUS: The scientists have had this matter under observation and study and have decided and so published, that the cause of blight is bacteria. As yellow fever, diphtheria, smallpox and other contagious diseases are caused by a germ, the same may be said of blight. It is a germ disease and is transmitted to the tree in different ways. Cutting the blighted branches from a tree with a knife, and using the same knife to cut or prune a healthy tree, without having sterilized the knife, is one way of spreading this disease. Mosquitoes sucking the blood of a person affected with yellow fever, then biting a healthy person, the poison is taken into the circulation in this way and the one so bitten is inoculated with the disease. Now if the blight be on a tree, it produces a diseased condition of the sap and insects feeding on it and then going to another tree to feed, produce the same effect that a surgeon does in using a knife in a contagious disease and then using it on a healthy person. You can cut it off and destroy it if the knife is sterilized.

MR. DEWEY: Then you cannot cut out any blighted parts without affecting the whole tree?

MR. WATROUS: It is like some of the diseases affecting men and animals; it does not affect the whole system if you eradicate all the part that is diseased, the rest of the tree remains healthy.

MR. FULTZ: Is it not settled that this bacteria enters through the cut places? I have had trees affected with the blight cut down until the whole tree was gone.

MR. WATROUS: I have had trees that had the blight and it would affect just the twigs, and then at the end of the season you would see a distinct line of demarkation and what is below looks just as healthy as the other trees, but it dies from some cause or other.

MR. FORSTER: If the trees are blighted they are affected more in June or the early part of July; when disease begins it is only a little time until it takes a limb.

MR. WATROUS: And if this limb is cut and a wasp or bee dips its feet in it and goes to the next branch it infects it, it may

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go down one of the branches to the ground, or go down on both branches. There is no reason to suppose that it would go down. The diseased condition of the sap works where it is, but the disease must be carried in some way. Some trees can resist the disease just the same as a strong man can resist a disease and others cannot. If the poison is left on the branch it will be taken into sap.

THE PRESIDENT: Mr. Forster, if any of your Monroe county men come in, we will give them the privilege of discussing this or asking any questions they may care to.

MR. DEWEY: I would like to ask Mr. Watrous if one season might be worse than another in producing blight?

MR. WATROUS: A very great difference. A dry or cold season does not produce much blight, but if the rains are excessive, so that the trees put on a thick growth, and the trees are succulent they are more easily infected by the disease. The French call blight "a stroke of heat." It is a disease, and like yellow fever, is more prevalent in wet, hot weather.

MR. VANNOY: About nine years ago I planted about eighteen pear trees. For about eight years they grew well then the blight came. One day in June I noticed a cluster about the size of a man's hat. I took my knife and cut it out a little below the blight. I have been cutting at these pear trees and this year there are none of them left. This blight spread to the young apple trees. I could not get rid of the blight.

MR. MCDOWELL: Since we have discovered the disease, I would like to discover a cure for it. There seems to be a tendency to believe that cutting away the tree would be of little benefit. If your apple orchard takes this blight, which is the best cure, to cut the entire tree away or to cut out the part of the limb affected. I would like to ask the society what they would advise in that case?

MR. CLARK: I don't know much about this blight business. My father was troubled with this blight. I did not raise any pears until about ten years ago; I selected the Kieffer. This year they got more blight than in the last ten years. I would like to find some way to remedy it.

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AFTERNOON SESSION—WEDNESDAY.

EDUCATIONAL VALUE OF FARMERS AND FRUIT GROWERS ASSOCIATION.

J. W. JOHNSON, ALBIA.

Members of the Southeastern Iowa Horticultural Society: I have never attended an association of any kind whether of teachers, preachers, editors, good roads people, beekeepers, fine stock breeders, state or national dairy men, or horticulturists, that I have not been profited thereby. There are three important means of gaining knowledge, viz: reading, travel and association. The bookworm is not of necessity a well-informed man or woman. He may read and read and not digest and assimilate and make good the theories and ideas of the writers, and not be able to make practical application of these things, to know life and bring satisfaction and prosperity at every turn.

This intelligence, however, if supplemented by travel and association with well-informed, practical men and women, in his line of business, will crystallize and become highly useful, will become seed thought, out of which may come an active, productive, useful and happy life. It is what we do not know that hurts us. Many people are destroyed for lack of knowledge. He who can mingle with his fellows, with the best informed, and get from them their best, is skillful, is the best student, is sure to become eminent in his calling. It has been my fortune and pleasant experience to mingle in many conventions and associations. When, in 1892, President Harrison, one of the purest, noblest men who ever graced the president's chair, addressed the National Teachers' Association at Saratoga on "The Value of a Lofty and Pure Citizenship in America," I was there, with 7,000 others. When the first gun was fired upon that great enemy to farmer's industries, "fraudulent butter," at Cincinnati, in 1883, before the National Dairy Association, where 350 delegates were present, representing twenty-seven states, your speaker was there and pulled the trigger. When Iowa was represented at the World's Fair in New Orleans, in 1885, by hundreds of specimens of her finest butter and cheese, where men from all countries of the world studied American dairy processes, I was there as one of Iowa's dairy commissioners. I do not mention these facts by way of egotism or personal pride, but simply to show you that what I say upon this subject is based not upon theory but practice.

I have not simply been told that it is a good thing to mingle with your equals and superiors, but I know this to be true.

Take the fine stock industry and general farming, the meetings that have been held in Iowa the past score of years, you cannot estimate their value.

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What progress would have been made with fine hogs except for such men as Prine and Lytie, of Oskaloosa; Vale, of Van Buren county; Tom Patton, Tom Castle and Frank Orr, of Monroe county? What would have been the history of fine cattle in Iowa without such men as Harra and Parsons, of Jasper county; Lunt and Seevers, of Mahaska; Fall, Giltner and Elbert, of Monroe county? In horses we have Stubbs, of Fairfield; Elliott, of Knoxville; Singmaster of Keota; Griffin and Galliers, of Albia, and there is no limit. So it is in every important line of agriculture. These men are intelligent, prominent, useful. Some of them have become wealthy and some have gone down to poverty in the struggle, but their ideas have lead on to better conditions. John Stewart, the inventor of the American creamery system, never got rich at the business, but who can estimate the value? The associat on with these men has made every man with whom they have come in contact wiser and better. So in horticulture. If you knock out from the annals of Iowa the names of Budd, Craig, Matthews and Seevers, and other men of their kind, you had as well attempt to cut out of the literature of the world the names of Shakespeare or Bacon, Longfellow or Dickens. The value in these farmer's associations is not all, or nearly half, in the papers that are read. Much good comes of the discussions. There are gold nuggets lying around under the surface, there are diamonds in the rough that sparkle out at unexpected moments. But the discussion is not all. It is the inspiration of the handshake and the friendly smile it is the bright suggestive conversation at the table, at the hotel, in the hall, in the home, on the streets, that brings results most valuable. You people who are here know better than I do the value of these associations. You have mingled in this society for years, you have talked of the best varieties of apples, the most profitable cherry, the most delicious peach, the most commercial strawberry, you have figured the profits, you hav· analysed the soils, you have gone bug hunting, you have talked for and against the birds, you have looked squarely in the face of the advantages and the evils of the commission system, you have condemned the middleman and tried to market your stuff In your convention rambles you have got up early in the morning and gone blackberrying, or been out in the orchards pruning and found some fellow who said, "Hold on there, do not cut the trees, let them grow." You have found fellows making cider out of rainwater and acids and cheating the people at the state fair, you have done all these things in these conventions and you are a wiser and better horticulturist on account of it. You who know the secret and power and pleasure would not lose it for money. There is no higher good than this splendid association together. The man who contents himself to remain at home and roast his shins and toast his chestnuts (his antiquated ideas) is losing the best part of his life. He cannot do as much for himself nor his family, he cannot do the world a frac ion of the good he could do, and if he would get up, put on his Sunday suit, go to the horticulture meetings listen attentively, even if he could not take part.

We are especially glad that you are in Monroe county at this time, because there is positive need of a great awakening on the subject of fruit growing. I do not mean to say that the people are backward or indolent or inefficient in this viciniity, especially in fruit growing but I wish to convey the thought that the conditions have changed in the last three or four years and the

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future is to be so different from the past, the demand so much increased, the market so much more active and exacting, that Monroe county must have more fruits, both as to kind and variety, or other sections will profit by what our own people will not do. Six thousand or 8,000 people have been added to this county in less than that many years. There is a crying need for small fruits of all kinds, and for orchard produce as well. Stand at the Q. or Wabash depots in Albia any day and see the fruits that arrive here from market centers and realize what profits would accrue to our people if they would fill this demand, and you have my meaning clear and simple. If you can inspire Monroe county to plant more fruit and cultivate more orchards, to organize farmers' institutes, and come together on these great questions, you will have done these people a great service. We have no farmers' institute, we have no men or women who are willing to use the columns of the local paper to promulgate better ideas on these subjects.

I leave off where I began—that agricultural associations are a great educator; they build up, they do not tear down; they enlighten, but they never impoverish; they make better homes, they make better citizens, they will make a better heaven when the time comes than you or I would have had without them, for when we go we will take heaven with us, and we will not carry it in a basket with the lid tied down with a copper wire, but it will be in our hearts, our lives, our ideas; it will be us, simply us, supplemented by the presence and glory of the Man of Galilee, the Lowly Nazarene, and the millions who by reading, travel and association have fitted ourselves for such place and society.

MR. CLARK: I think this was an excellent paper.

MR. FULTZ: There are two statements in this paper that strike me quite forcibly, and one is that they have no farmers' institute in this county. We have them in our county and all the neighboring counties. We think they are a good thing as an educator. We discuss horticulture, too. I believe there is more and better information disseminated in that manner than in any other way. We discuss these papers through the local papers. I believe the local paper is the best medium for discussing horticulture. It would be a good thing for Monroe county and every other county in the State, to use the local papers to discuss this subject. A great deal you get through agricultural papers is not practical, but what you get from the farmers in your immediate vicinity through the local papers is of far more value. What is a success in one locality is a failure in another locality. I think the paper was good and should be printed in the local papers.

MR. ROBINSON: We undertook some years ago to organize a farmers' institute here, but it seemed that the farmers were so busy that they failed to respond. We made a strenuous effort here to organize an institute. Each institute draws from the

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State $75 per year. There are some of them here still in the same mind and were talking a few days ago that it ought to be done. I have attended a great many of these associations and felt that it was a great help to my work to attend. It is the same in all branches of business; you profit by meeting with those interested in the same line, and learn there what you would not learn at home. I heartily endorse Mr. Johnson's paper, and hope it will increase the interest in horticultural meetings here in our own county and as the demand for fruit increases it means better markets for us, so if a man gives attention to it, he is never a loser.

MR. BLODGETT: I want to enter a little testimony as to the good derived from these institutes. I want to cite a little instance that occurred at Mount Pleasant. A gentleman read a paper on transplanting the hard maple. It was considered so good that it was printed in a local paper. A gentleman there wished to transplant some hard maple trees and I gave him the paper containing the report, and he said that report saved his grove of hard maple trees when he transplanted them.

MR. MASON: I am in favor of farmers' institutes. I would like to get one started. I think if we could once get it started we could keep it going.

MR. GRAHAM: I think the paper elegant, and when I saw Mr. Johnson's name on the program I knew we would have something good and rich. I have been urging the farmers' institute, and I know if we could get it started we could keep it going.

MR. FULTZ: We started one in Muscatine county, early. There were only two or three then. We got up a constitution and by-laws, and in less than a week we had the forty names necessary, and two or three of us got together and made out a program. At the first meeting there were about one hundred farmers present, and we have had an institute every year since and have about three hundred names on our list. All that was required was to get their names to attach to our constitution and by-laws.

If you call a meeting and get only a few out you can organize any way. The local papers do not wait for us to hunt them up and hand in our papers, but send a reporter to take our program. Our institute was held last year at Wilton and a reporter telephoned the proceedings to the papers at Muscatine. They are always glad to get all the essays that are read.

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MR. MCDOWELL: In speaking of the farmers' institute paying, I am interested in the farmers' welfare, and money to them is money to me. I have attended the meetings in Iowa county every year, and I don't think you can ever spend a day or two more profitably. The plan in Iowa county is to have a two or three days' session and hold it in one day sessions in one town or in towns not far apart. The farmers over the county are interested and are becoming more interested and it is no trouble to get out from three hundred to four hundred people, and I don't think you will find a more prosperous county than those in which such institutes are held.

MR. JOHNSON: I want to say just a word about Mahaska county's institute. It was organized immediately after the court house was built and the farmers had a room set off for them in the court house. There were some eight or ten men organized an institute and some six or seven of them would be there every Saturday. This formed the start of what I believe to be the best farmers' institute in Iowa. Last year I attended and there were about fifty specimens of golden butter, there were rooms filled with apples and corn and an exhibit of school work, and I never saw such an interest in that sort of thing in my life.

LESSON I.

SHADE TREES, WIND-BREAKS, ORNAMENTAL AND EVERGREENS—WHAT VARIETIES—HOW AND WHEN TO PLANT—HOW TO PROPAGATE—PRUNING AND AFTER CARE.

(Mr. Watrous acted as teacher in the absence of Mr. Tatum.)

MR. WATROUS: The subject we are to consider for a few minutes is Shade Trees. We all know that in this country we do not have enough shade trees. If you plant shade trees in this town there may be telephone people who will come in and cut and mangle your trees, and you have little redress. I would like the streets lined with trees and instead of having some Box-Elders in one block, Elm in another and Cottonwoods in the next, we should have the trees so planted that they would form avenues through which you might look and the eye be rested and the soul given peace. What varieties would you plant?

MR. CLARK: I would suggest the Bur Oak as the most hardy. It is a good tree. Now a Walnut is a good tree to raise and I might say the Ash.

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TEACHER: What would you say about the White Elm?

MR. CLARK: I should prefer the Red Elm.

TEACHER: What is your choice of all the trees as a shade tree?

MR. CLARK: I think the Ash.

TEACHER: Is the foliage heavy enough to suit you?

MR. CLARK: Yes, sir.

TEACHER: I think you mentioned the Bur Oak. How would you get the young trees and how long would it take a young tree to grow up and make a shade?

MR. CLARK: I have had Bur Oaks for thirty years. You cannot kill them out.

TEACHER: Does the Bur Oak grow quickly?

MR. CLARK: It does not grow as quick as the Elm. It can be propagated very easily. I think we could raise them with success.

TEACHER: We want to know about trees that are especially advisable?

MR. DEWEY: In selecting shade trees, I should say the Hard Maple first, the Elm and Ash in some localities, and the Soft Maple, not at all. The foliage of the Ash is a little "shy." My objection to an elm for a street shade tree is that it is too large; otherwise, it is very desirable.

MR. MASON: I would prefer the Elm and Ash next.

TEACHER: Which Ash do you prefer?

MR. MASON: I like the White Ash. They make a very symmetrical tree without any pruning. The telephone people spoil the trees. I admire the Elm very much; it is one of the best trees for street purposes. The Hard Maple has a habit of dying when it gets to some age. I have one that I planted in my yard 21 years ago, and it is not more than 21 inches through, and it is dying at the top, and I have seen others doing the same.

TEACHER: Does it stand in turf? You must take up the sod around it. When is the proper time to plant shade trees?

MR. MCDOWELL: I would like to say a word in praise of the Hard Maple. If you want to see a pretty tree early in the spring and late in the fall, plant the Hard Maple. I think it is the best tree for our lawns and streets, and I have found that it is hardy and long lived. I have not had much experience in shade trees, but would plant the Hard Maple, and I am sure it would prove of value to me in the years to come.

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MR. BLODGETT: The Hard Maple is taking the place of the Soft Maples and the Cottonwoods on the lawns and streets, and until the drouth of two years ago they were perfectly healthy. The one fault about the Elm is that it finally becomes too large in the street and overshadows anything else. Still, next to the Hard Maple, the Elm is planted more than the other trees, The Catalpa makes a very good shade tree.

MR. VANNOY: Have you no Carolina Poplars for shade trees? I am wonderfully impressed with the Poplar.

TEACHER: I think the Carolina Poplar is a good tree to put between the permanent and more enduring shade trees, and it may be removed after the other trees have got their size. Is there no one else who will tell us about shade trees?

MR. MASON: Evidently trees are not for use or beauty only, but for both. I would like to know why a farmer might not set out a row of apple trees outside his fence. They would not grow too high to be detrimental to the road.

MR. DEWEY: I can say that it has been tried by Mr. Smouse, who owns an addition to Washington; they are damaged and eaten and are not so hardy as other trees.

MR. CLARK: You cannot raise an apple tree without cultivation. It costs quite a good deal to raise it and you want to get the benefit of it. The Russian Mulberries are good shade trees and are good for fruit, too. I will not cut Bur Oaks down; I am leaving them in the pasture and they are one of the best trees we can get.

TEACHER: Will some one else give their opinion of the Bur Oak?

MR. ROLLS: I have had a great deal of experience in planting trees for shade. I think a great deal of the Elm as a shade tree. It is hardy and makes a beautiful tree. I plant them as much as I can for shade. I have had a great many Bur Oak trees and I let them stand, as Mr. Clark suggested, as a benefit to the future. They are quite fast growers. They are not very good as a shade tree, but are a permanent tree.

TEACHER: Did you ever know of anyone taking them from the forest when they were young and how they behaved?

MR. ROLLS: I have not.

MR. CLARK: I have no knowledge except one tree. It was a large Bur Oak and was moved from thirty to fifty feet and I think that it is growing finely now.

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TEACHER: Before we accept the Bur Oak we must settle among ourselves that they are of reasonably quick growth. We will begin with the Bur Oak. How many of you would receive the Bur Oak as a shade tree? I see two in favor of it.

TEACHER: As many as would receive the Elm, raise your right hand. I see seven in favor of the Elm.

TEACHER: How many of you would receive the Hard Maple? I see twelve in favor of it.

TEACHER: The Ash, how many of you would receive the Ash? Let me see your right hand. Seven in favor.

TEACHER: Our next subject is Wind-Breaks. Can anyone tell us what trees are good for wind-breaks?

MR. CLARK: Personally I know nothing about it, but a friend of mine thinks the American Larch is the tree for wind-breaks. He planted quite a belt of Larch, and I think it is standing quite well today.

MR. DEWEY: The best wind-break that I have seen is the Spruce, and the more I see of these trees the more I approve of the Spruce.

MR. VANNOY: The Mulberry and Scotch Pine are both good for wind-breaks.

MR. HARRINGTON: I would say the White Pine.

MR. MCDOWELL: I think the White Pine is the best. My observation shows me that it has been the best wherever it is planted. I do not remember of ever seeing a White Pine die of old age, while the Spruce will die all at once. The Colorado Spruce are a little expensive here and slow growers.

MR. BLODGETT: I prefer the White Pine. I planted some, thirty years ago, in Des Moines county, and they made a great growth, until within the last year or two, when they were cut down.

TEACHER: In the freeze of 1899 a great many Scotch Pines were killed.

MR. MASON: I was going to give a little of my experience in the winter of 1899; I lost a great many trees. I found that the White Pine was the only one that went through without a scorch; it is the king of Evergreens.

TEACHER: Who else will tell us something about evergreens?

MR. DEWEY: I would like to ask a question about the White Pine. I have seen some destructive work from the sleet on the white pine.

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TEACHER: The Austrian Pine will stand more than the White Pine.

MR. CLARK: I know of trees between fifty and sixty years old that are in good shape.

MR. VANNOY: My observation has been that the White Pines that were planted fifty years ago have the under limbs gone and that is a detriment to a wind-break.

TEACHER: Do you know anything about Austrian Pine?

MR. VANNOY: I have been observing this tree for about 25 years. There is another tree I would like to introduce, the Platte River Red Cedar. I have seen a wall of them 20 feet tall and it makes a good protection from the wind.

MR. CLARK: That is the common Red Cedar?

MR. VANNOY: There are two kinds, the Red Cedar and the Platte River Red Cedar.

TEACHER: The Western tree is much more healthy here. The Russian Mulberry has been spoken of as a wind-break. Has no one anything to say about that tree?

MR. FULTZ: This question of a wind-break is most important to prairie farmers. I have a fine wind-break of oaks. We do not know how cold it is around our buildings. For several years I was assessor and in traveling around over our township I found the door-ways covered with snow. The wind blew the snow in their yards. Where you have wind-breaks they catch the snow before it gets to the buildings and yard.

TEACHER: We will next consider the subject of when and how to plant, Who will give us an idea? Shall we plant in the Fall or in the Spring? If no one has anything to say on the time of planting we will put it to a vote. Now as many as are in favor of planting the Evergreen trees in the Fall, raise their right hand. None. As many as are in favor of planting them before the buds begin to swell in the Spring, raise their right hand. None.

As many as would plant Evergreens after the new growth is started in the Spring, raise your hand. Unanimous.

So now we have the White Pine, Scotch Pine, Austrian Pine, Arbor Vitæ and Spruce and Larch for wind-breaks. Those who believe the White Pine to be the best of the tall wind-breaks, raise your hand.

Thirteen in favor of White Pine.

How to Propagate. We do not need to go into that at all. The average man who wants to plant a tree would rather pay

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twenty times what a tree would cost than to undertake to grow them from seeds.

MR. RICHEY: I would like to ask a question. Where would you plant a wind-break for the orchard?

MR. MASON: I would leave the orchard open. The wind-break takes up materials from the ground that the orchard needs.

MR. MCDOWELL: I am of the same opinion as Mr. Mason. Taking the vitality from the soil to nourish a wind-break spoils lots of good fruit. Under ordinary circumstances the orchard will do well without a wind-break.

THE PRESIDENT: Mr. Eden will open the subject of "The Peach of the Future."

MR. EDEN: Through some mishap or other I left the paper at home. The peach of the future, as I see it, is the seedling, Iowa's own seedlings. I have given them a good test.

MR. MASON: We planted five trees in the garden, and from these trees we gathered more peaches than we did from an orchard of budded peaches. From my orchard of budded peaches six or seven years old, did not get enough peaches to pay me for planting them, and I cut them out.

MR. MCDOWELL: I do not approve of the promiscuous planting of seeds. These seedlings that have been lately introduced are a good thing, but the ordinary seedling peach will prove a failure when they come to a bearing age. I have seen the budded peach make a fair crop in the territory where I have traveled.

MR. EDEN: I believe in selecting the seeds.

MR. CLARK: I have had quite a little experience with seedlings. In 1878 I picked up about a bushel of seeds in Council Bluffs and we planted them and took good care of them. They will miss one year in four in bearing. I believe in planting the best of seed.

MR. PAYNE: I would like to have some one tell us something about the seeds. I would like to know whether they come true to the seed.

MR. EDEN: If the tree they come from is isolated from the other trees they will come the same.

MR. MASON: The Bailey peach produces a tree and peach like the parent, with very little variation. I don't think a pit would produce a tree like its parent with any degree of certainty.

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MR. FULTZ: In regard to the Bailey pit it was brought from near Davenport. The peach does not always reproduce itself from the pit. There are orchards that do not do the same though they are planted from the same pits. In January, 1899, whole orchards were killed, while the same kind of an orchard just across the road lived. It seemed to be a difference in the age of the orchards. The Bailey pit does not always reproduce itself, but by watching and taking the best always we can improve the quality of our fruits.

MR. EDEN: These pits I spoke of came from Lathrop and I planted them very carefully.

MR. WATROUS: If you plant the seed of an apple and the tree has no other like it, the trees are apt to be like but not identical. The reason is that the conditions of this earth are constantly changing. I believe that the peach of the future in Iowa will be a peach grown on Iowa soil. The same seedlings that grow on Iowa soil and are planted here under the same conditions in which they are grown will be the strongest and best. The sooner we plant the sooner will come the peaches for our cultivation.

MR. CLARK: I have been raising seedlings forty or fifty years and we raise from a bushel to fifty bushels a year.

ANNOUNCING OF COMMITTEES.

Adjourned to meet at 7:30 P. M.

WEDNESDAY MORNING SESSION.

Song of welcome, by the quartette.

ADDRESS OF WELCOME.

BY J. W. JOHNSON, OF ALBIA.

I am glad to speak for Albia a word of welcome for those who are here on this occasion. This is a very old business, because I remember that Adam was engaged in the fruit business in the garden of Eden.

The city of Albia is situated in the center of the "Q" reservation, on three lines of railroad, about as near the center of the universe as it is possible to get. The railroads furnish us with over thirty passenger trains a day. They reach Chicago, the Twin Cities of the North, Omaha, Kansas City and Saint Louis, any one of these cities, in about seven or eight hours. In this way they convey our people from their homes to any of these cities

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in the twinkling of an eye. It brings to us the products of the world's markets and lays them at our door. Albia is growing very rapidly. From a town of 2,800 a year ago the vote and school census show that we have 4,000 to 4,500. One of the principal causes for this growth is the mines which surround us, where 3,000 men are employed at excellent wages. The coal output of this town last year was 20,100 cars.

We have lately built a fine new court house. We have within the last few years laid twenty blocks of paving. We have nine or ten new business blocks in the course of construction at this time. Less than a week ago we lost $200,000 by fire.

I was asked to turn over the keys of the city to you, and the people of Albia all wish to make you welcome.

Your work is for the betterment of humanity. You cannot educate people who are not well fed. And so it is that those who are the best fed, the best cared for, who live the life that best presents them to each other, and who can do the most for each other, that is the business you are engaged in, and I wish you success and a hearty welcome to the city of Albia.

RESPONSE TO ADDRESS OF WELCOME.

BY W. S. FULTZ, MUSCATINE.

Mr. President, Ladies and Gentlemen: In responding to the eloquent address of welcome by the gentleman who represents the good people of Albia, we desire to thank them most heartily for this welcome to their beautiful city. We take pleasure in meeting with you on this occasion and in taking note of the push and energy of your people, and I know that we will all feel quite at home during our brief stay among you. We realize that the people of Monroe county are favored above the citizens of most other counties of the state. While you do not own all the earth you own both the upper and under sides of it and are working both sides for all you can get from them. From the fair face of Mother Earth you harvest bountiful crops and from the depth of her bosom you bring forth uncounted ebony treasures that contribute to your comfort, your prosperity and your wealth. In Monroe county and in southeastern Iowa as well horticulture has made rapid progress and has held its own with other great industries of the state. Fruits from the state of Iowa have been brought into competition with those of other states and have usually come off victorious. But in the face of this grand and glorious record that horticulture has advanced into new and wider fields, taken on a magnitude and importance not dreamed of thirty years ago and that new problems have arisen and will continue to arise, all of which we are anxious to solve, it is important that horticulture should be up and doing and it is for this reason that we are here.

Ever since Eve ate the forbidden fruit in the Garden of Eden, man has been striving after horticultural knowledge. What a fine thing for us men it is that we have one thoughtless act of a woman to which we can refer. To us it is like an oasis in a desert and yet that one act in the very nature of circumstances has certainly had a very harmonizing effect upon society

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and has no doubt been the means of leading us into a scientific research unfolding many of the hidden mysteries of our calling and with the generosity that is characteristic of the descendants of Mother Eve we have been taught lessons of industry in horticulture which will grow and develop down through the ages. It was through the untiring energy, push and perseverance of these pursuits of horticulture that there has been reared so many grand and beautiful homes all over this country.

Divest a home of garden, fruits and flowers and what have you got; simply an empty, soulless habitation wherein dwells naught but poverty. Even though there may be the wealth of the millionaire, they who occupy such homes are robbing themselves of the real joys of life and will find in their declining years that their only fruitage is a mere handful of husks. But surround your homes with the beautiful and fruitful productions of the horticulturist under the influence of a healthful moral and religious sentiment, where industry, temperance and living faithfulness go hand in hand, and there shall be found that safety which will care for the best, noblest and highest interests of our country. It is such homes as these we are trying to help build and it is to consult and tell of our experiences and to learn of each other that has brought us together in your beautiful and flourishing city.

We come in the hope of learning something ourselves and to help your people who may not have given the subject the careful study it deserves. We hope the good people of Albia and Monroe county will turn out and ask questions and tell us all they know about growing fruits, flowers and vegetables, and thus encourage those who may not be making a success along these lines, so that a more advanced horticulture may be the result of our coming together.

Horticulture has become an honored profession and one of the most reliable, pleasant and profitable in which man can engage. In all the universe we can think of nothing more pleasing and interesting to mankind than watching the growth of things, and all things that have life must grow and die. In the springtime as we watch the bursting of the buds upon our trees from their dormant state and behold the bloom of Mother Earth clothed with living green from the germination of tiny seeds and behold our trees bloom and bear their rich fruit on bended bough, and our broad fields of waving green ripen its golden harvest, we are drawn into closer and sweeter communion with our Creator, the great and Allwise Teacher, and better fitted for nobler deeds and greater usefulness and enabled to lay deep and broad the foundations of a glorious future on which coming generations may build with safety. We of today should not forget that with all of our refined and Christian civilization, we are only the fruitage of toiling and intelligent generations that have preceded us in the many centuries of the past, and as yet we do not behold the perfect man, neither the perfect flower, fruit or vegetable, and no man may ever be able to draw a line in the field of horticulture and say, "Thus far and no farther shall improvements come." For the great Creator has endowed mankind with an intelligence and power over the vegetable kingdom which in its results is little short of creation itself.

In carrying out this God-given power, we must continue to think and work to build up and improve the fruits and flowers that the Great Creator has given us that we may, as horticulturists and as free American citizens,

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be ever faithful to the sacred charge committed to our keeping, so that when our labors here are ended and we pass over into that bright and beautiful home beyond the hereafter, we may be permitted to view the perfect fruits and flowers that grow upon the banks of the beautiful river of life that flows by the throne of God.

It was with sincere regret that we learned of the direful calamity that so lately befell your beautiful city, when the fire fiend destroyed so large a portion of the business part of it, and this society most certainly sympathizes with the good people of Albia in their loss; yet we feel and know that with their well-known push and energy, the citizens of Albia will soon rebuild their burned district in a substantial manner, so that it will be even better than before the fire.

Mr. Speaker, on behalf of this society, I again thank you and the generous people of Albia, whom you represent, for your kindly welcome.

SCRAPS.

BY S. B. DEWEY, WASHINGTON.

The spring of 1903 in our vicinity was ushered in and announced by heavy thunder from the 1st to the 6th of March. The robin looking rather lonesome was waiting around on the 8th and that faultless and ultra desirable blueblrd, more plentiful than for years, received a royal welcome about the same date.

On the 12th the peony bulbs were awakening and the grass blades were cutting their way into existence again by the 15th. By the 18th the horned lark had hatched her young.

Then as usual we had a change, snow covering the ground. On the first of May winter made its last stand, with bad effects upon the fruit, etc., also killing the hard maple seed in these parts.

May 20th to 22nd blizzard in the Northwest and 90 degrees above zero in New York. June the 12th Jack Frost in his familiar and offensive manner had been kissing so promiscuously that the more tender vegetation had met the enemy. June 14th a whole township of corn near Vincennes, Ind., the most extensive and richest area in the county had been killed by frost, necessitating replanting. This was the first June frost ever known there. Heavy snow in Montana July 1st and 4th, snow and cold weather in Wyoming, and same date men had their faces frozen in Colorado.

New York on October 9th showed what it could do in the unprecedented rainfall in that locality, over ten inches in thirty-six hours.

We have had in this locality an ideal summer, not one day of high temperature, and people seeking pleasure resorts would have found it unsurpassed here. The possibilities of the United States from a climatic standpoint are unlimited. It is no wonder our Uncle Samuel so frequently has a chip on his shoulder. This country can produce or do almost anything or anybody.

Last spring the ground was in different condition than for years, owing to excessive rains the year previous. Roads were almost bottomless in our

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vicinity. Near our city was a place where it was impossible to cross, and a boy was employed in piloting the teams around.

Mr. Heind, a teamster, stuck in the mud so deep just west of our city that the team was helpless. The adjacent ground was so soft no other team could assist, so a house-moving apparatus was secured and succeeded in extricating them, one of the horses dying shortly after.

We complain frequently of the overplus of rainfall and other record-breaking weather as temporarily bad, but in the end, we surely receive untold benefits in a more permanent way. It has not been many years since heavyweight articles were written, claiming that the tile was causing the drought, and unless removed the country would dry and burn up. Now, if a chunk of burnt clay with a hole in it contained the aforesaid claimed power, why not, in all fairness, give it the credit of possessing some other virtue, which caused the heavy downpours of the last two seasons. Just as long as such ridiculous claims are made, the torch of the iconoclast should be kept lighted, ready to consume such information on sight.

About ten years ago a lady canvasser did our city on fruit and flowers, though mostly flowers. She sold six roses (choice kinds) for $5. They went like hot cakes, and in a short time she had a nice long list of orders from the best people of the place, but when they came, they were not only all of one kind, but very inferior. We did not need any flowers, so I bought some fruit trees, all of which died, save one, I bought for a quince, which proved to be a peach. The other side of this picture is this: That little peach tree is still living, having run the gauntlet of the test winters and borne several crops of fine fruit.

This season they were in demand by the small boy whose scent for such things is as keen as the hound in the chase.

One evening, about ripening time this fall, after we had retired, we heard whispers near our bedroom window, where the tree stands. On getting up to investigate, of course we ran into a chair, making a sound which caused four little feet to beat as two, two little hearts to beat as one, and the retreat they beat was very neat as well as hasty and informal.

I am pleased to say we had quite a fine crop of peaches this season, and quality much better than shipped goods.

It is interesting to observe the painting of the apple, take the Jonathan for instance, in Mid-June its color is a good strong cholera green, July 1st the Aurora Borealis streaks are shooting from stem to blossom end. Each day the color of the paints are changed, the intervals between the streaks are gradually reddened until the apple becomes nearly one solid color with delicate shadings at the ends. It does not stop there, the fall days add a still richer, darker hue and in the end the silent artist has produced the most gorgeous and magnificent combination of colors known to the apple peel or elsewhere.

It is claimed that out of all the elements which bring about this result, the sun is the most prominent, and in the old countries you can leave your order for your name or monogram grown on the fruit and the same will be delivered, according to order. While the sun is doing this another element is painting the seed snug in its little bed, from no color to jet black.

In the fall of 1902 a man was trying to build a terrace in front of his property out of material taken from his cellar. He had about the hardest

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proposition on his hands in that line I had seen. The clay was about the consistency of grafting wax, and stuck to anything it touched like a porous plaster. He finally gave it up, waiting until spring, went back to finish his work. In his absence Nature's trusted agent had called and reduced this stubborn stuff to a pile of yellow ocher, which could be handled like flour.

Fellow horticulturists, the people living in the upper Mississippi Valley, the State of Iowa and our own Southeast District, are to be congratulated. There is no better place the world around, for the short sojourn allotted us, and there should be more contentment to the square inch than by any other peoples on the earth. The average man surrounded by the comforts of the farm, orchard and garden is about as nearly satisfied as it is possible to be. With few exceptions history fails to record the fact that riches, place or power brought entire satisfaction.

GINSENG TO DATE.

BY F. O. HARRINGTON, WILLIAMSBURG.

A belief that some of our members of the Southeastern Iowa Horticulural Society are interested in the development of ginseng culture, since the period at which I read my paper on that subject before this society in November, 1896, has induced me to write of it at this time.

The then infant industry of growing the plant in a commercial way in an artificial manner and under artificial conditions, has undergone a transformation as startling as some changes accomplished by a clever magician before an audience. The business in the past four years has rapidly passed into that condition familiarly known as a boom, and one cannot pick up an agricultural, horticultural, or even an ordinary newspaper or magazine without finding some article setting forth, more often than otherwise, some extravagant statement of the wonderful money-producing quality of this new aspirant to public favor.

Until a very recent period all of the ginseng produced and marketed in this country was entirely a product of nature, that is, obtained under conditions natural in the forest in many states. As I have just intimated, since I wrote my paper in 1896 the news has been spread far and wide by the press that the consumption of ginseng is enormous, that our American supply is rapidly becoming exhausted, and the price steadily increased, that the plant can be readily grown under reasonable conditions and at a good profit. As I stated in my former paper, there was no literature on the subject at that time, but about that time or a little before, a short bulletin was published by the Department of Agriculture, at Washington, D. C., which, however, I have never seen, and another, or rather a revised edition was issued by the department in 1898, which issue I have, and since that time various bulletins and books, as well as, in the past two years, special ginseng papers and periodicals are issued in monthly or quarterly installments. So that now one may, if he will, obtain instructions that will be of material help in beginning, but after all, the business is in an incipient stage, and the things we do not know about ginseng evidently would greatly outnumber those we know.

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I will first tell you something of our experience since my last paper was written. Experience, as you all know, is a severe teacher, but some of us do not seem to learn readily in any other way; but a thorough lesson was given to my brother Millard and myself on the ginseng question in the winter of 1898 and 1899. Up to that time we had put but little mulching upon our beds, and both of us, through press of other work and some carelessness, had failed to put on any additional mulch since the year previous, and upon my own beds I knew it was very thinly spread. You are well aware what effect that terrible freeze in February had upon trees and plants not well protected, and can easily imagine the effect on the roots in those illy-protected beds. In my case the destruction was complete, and with my brother very severe, leaving him but a fraction of the plants he had and some stratified seed ready for planting. It was quite a setback to our operations, and I had nothing to commence with for a little while, but am getting something of a start again. My brother, on the other hand, has quite a patch growing in its season. He had a portion of his plantation in an evergreen grove and with better mulching over the beds, and there the damage was slight. Neither of us now have any plants under artificial shade, though this is not because we think they cannot well be grown in that way, but because the plants have done so well in the evergreen grove of my brother's plantation, that he is continuing to plant there altogether, while I am planting some in evergreen grove and more in walnut grove, under what I deem favorable conditions, after some experimenting. I will give a word of advice later on regarding kinds of trees to plant ginseng among, in the light of our experience.

Until the present year, my brother planted all the seeds produced on his plants, but he has the past spring and this fall sold seed produced in the summer of 1902 (you are aware that Ginseng seed must remain in process of stratification eighteen months before it germinates) to the amount of about $400, at an average net price of 66 cents per hundred seeds at wholesale, which price, as seed is advertised, is extremely low. The present season with several new beds producing some seed for the first time, he has one-seventh of an acre producing seed, from which he harvested and now has stratified about four hundred and twenty thousand seed.

He has been corresponding with some large buyers, and the probabilities seem strong that in the spring, he can sell this crop at about the same price, or possibly only 60 cents per hundred At this last figure and allowing a little for loss, this crop of seed from one-seventh acre would bring $2,500.00, or at a rate of $17,500.00 per acre, and with a like favorable season next year for seed production, this same tract should produce a largely increased amount, because several thousands of these youngest plants produced quite small clusters of seed, and the coming season should grow fine clusters, though there should be an increase in size of clusters for several years. There were heads among five-year-old plants that this season grew from 100 to, in one instance 166 seeds. It had been my brother's intention to dig several beds this fall, and dry the root for market, and he did dig enough for a few pounds of the dried root, which is worth now $6.60 per pound, but with seed worth even half of present price, the seed from these old beds next year would be worth more than the roots are now, and after the next year's crop of seed is harvested, the root crop would be considerably greater

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than now in weight, and possibly the price as good. It would have to be very much less than now, if it does not pay to hold these old plants another year, and get another seed crop before digging them. So they were not dug., Had they been dug there would have been produced roots worth $70 or $75 per bed, or at a rate of $1,600 to $1,700 per acre, which taken with the seed of the past three seasons would make a fairly satisfactory profit on a five-year crop. The beds referred to here are forty feet long and five feet wide including the pathways which are perhaps eighteen inches wide on level with top of beds, and are probably ten inches or more deep and narrow at bottom, and afford drainage to the beds, which are on a level tract. Both beds and pathways are computed in these figures. The beds proper are only about three and one-half feet wide, and rows across them contain ten plants each, and are ten inches apart, so a bed forty feet long has practically 470 plants growing in it if none are missing. Many of you doubtless have read in some of your papers what you considered lurid accounts of the wonderful productions of some small plants of ginseng, and the fabulous sums (at the rate of) obtained, and you set them down as the hallucinations of a disordered brain, or else attribute them to the corruscations of a diseased conscience. What shall you say regarding this little experience in seed production of one season in a little shady corner of an evergreen grove, one of the worst places of which there are always plenty on a large farm. So now I will give you another instance of ginseng culture wherein seed production figures not at all.

A Test. In 1897 the Experiment Station of Pennsylvania, under the supervision of Prof. Geo. C. Butz, one of the ablest botanists in the United States, began a series of experiments to ascertain the true facts in ginseng culture, and to what extent the claims made for it could be verified in actual cultivation as a money crop. After five years of cultivation the product was actually sold in the ordinary market as commercial roots and from the facts thus ascertained, Professor Butz has submitted the following estimate in which he states that "The most conservative figures are given."

The estimate is as follows:

80,040 roots at 10 cents	$8,004.00
900 posts at ten cents	90.00
Lath for screen roof	280.00
Boards for cross-bars and braces	100.00
Setting posts	75.00
Carpentry and screen	150.00
Plowing and preparing soil	100.00
Planting 80,040 roots	50.00
Weeding and mulching for five years	250.00
Digging 900 pounds	100.00
Washing and drying crop	100.00
Total	$9,249.00

Credit.

2,900 pounds of dried root at $8.50	$24,650.00
Deduct cost	9,249.00
Total	$15,401.00

Some of these expenses are certainly high and any experienced grower could cut them down materially, but then it is well to allow quite a large margin. Had a suitable grove been at hand for this test, many hundreds

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of dollars would have been saved, that were expended for materials and labor in constructing an arbor. It also seems to me that at the time these plants were set out they ought to have been purchased at six cents or thereabouts instead of ten, which would credit the account to amount of $3,200.

Shade trees of ginseng plantations should in no case be of varieties that are to an appreciable extent surface rooted, such as, for instance, willows, maples, etc., in fact a large share of deciduous trees, as well as some of the evergreens would send out such a mass of robber roots through a finely worked up bed that the ginseng would fare poorly. All things considered the pines, White and Scotch, are the best, we think, for the purpose, and are better to be of considerable height, with no limbs near the ground, and not thick enough to form a dense shade. The plants will do better where there is a little flickering sunlight playing over the ground a considerable part of the day.

This is the best place I know of for the Scotch pine. It trims itself sufficiently and is ragged and open enough to let sunlight through almost everywhere, and then it sheds a large amount of foliage (needles) for mulching material for the beds. To tell the truth this is the only place that I have ever seen this tree where it pleased me after it had attained some age. However, the White pine is fairly good if not too thick, and this, too, furnishes a large amount of mulching material. The cedars and spruces would not do at all, would rob every inch of your beds. So far I am pleased with my walnut plantation, few surface roots, were originally planted close together, and have grown up forty to fifty feet without very heavy tops, and have been thinned out considerably, so that with the small leaf of the walnut, it makes a fairly good shade. I have given this but two years' test, but think it will be all right. We cover all our ginseng beds now with two or three inches of evergreen leaves (needles) and let remain.

GINSENG BOOM.

To show how the boom is affecting the ginseng business I would state that present prices of seeds in a retail way are shown by advertisers in various papers, magazines, etc., for seed ready to grow next spring, from $1.25 to $5.00 per hundred seeds, and one-year-old roots from $5.00 to $10.00 and for three to four-year-old roots from $25.00 to $40.00. Verily ginseng growing is on the boom, and investors must pay big prices. When I previously wrote, the prices for the dried root were somewhere about $3.50 to $3.75 per pound, and it has been advancing nearly every year since. In 1897 was $4.70, in 1898 was $3.65, in 1899 was $4.00, in 1900 was $5.20, in 1901 was $5.30, in 1902 was $5.60, and now $6.60. These are average prices for our Western root, not special quotations. As a contrast to these prices if we go to the early fifties we find the price at practically fifty cents per pound, and the exports were double what they now are.

EXPORTS BY PERIODS.

	Pounds.	Av. Price Per lb.	Total Value.
Exports for 11 years, 1858-1868	4,343,519	$ .88	$ 3,862,095.00
Exports for 10 years, 1869-1878	3,932,868	1.10	4,359,451.00
Exports for 10 years, 1879-1888	3,577,330	1.84	6,608,350.00
Exports for 8 years, 1889-1896	1,884.698	3.18	6,012,273.00
Total pounds	13,738,415		$20,888,169.00

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For the past four years the exportation of American ginseng has been about stationary, at from 125,000 pounds to 130,000 pounds per annum.

What of the future? you ask. Will there be unlimited demand for all that may be produced at prices prevailing of late years. Will the demand at reasonable prices in China continue indefinitely, or will the Chinaman by whom it has been used and highly prized for centuries before the discovery of the Occident become Westernized and disillusioned and drop its use. There are two extremes of view in this question. The first is that the market for the good article is practically unlimited, and that twenty millions of dollars worth of the root might be sold annually in China. That there are four hundred millions of Chinamen, and all who can afford it use ginseng. That the demand for ginseng is so much greater than the supply that the next forty years will see no reduction in prices. That the supply has been diminishing for the past fifty years. That between the destruction by the "Sang" diggers and the assumption that the clearing of forest lands and the ravages of sheep and cattle are destroying fully as many of the wild plants as have been dug for the market by the "Sang" diggers. That in both cases these plants are gone and obviously will not be replanted or replaced. That against this enormous shrinkage in the area of wild plants the artificial growers have now a total area in gardens that is very small, and mostly young plants too small to market. They claim that we should not plant less than 150 acres in each year to balance up the destruction of the wild plants, and that the over production talked of by some promises to progress backwards into a decided shortage.

The other extreme argue that ginseng can be used only by a few Chinamen, owing to its extremely high price, and the price is high not only because of scarcity of the article, but also because of the tendency to make the business purely a gamble by many of the dealers, the price at which it is purchased here having little influence upon the retailing prices in China. That the great mass of the Chinese are miserably poor. That the time is coming when the Chinese people will think less of ginseng than they do today. That even if a minority of those who have gone into ginseng cultivation are successful the enormous increase in production will almost inevitably result in a serious reduction of the market price of the dried root, and some of these people prophesied along in '97 and '98 that before this time such a condition would exist.

And there you have it. Probably in this question as in many others, a middle ground, a happy medium will come nearest the truth.

One thing seems certain, that the present high price for seed cannot long continue, because one may readily see that the seed produced upon one acre, would each year plant quite an area, and no very extensive planting will be done at such prices. Men who have become interested will plant small plots, but not extensively. So keep this in mind, that the only real permanent value in ginseng culture in a few years will be in the dry root for the Chinese market; and for that, if artificial growing becomes extensive, the prices must be lower.

Very conservative authorities place the demand in China at about double present volume; were the prices reduced about one half [from] those now in vogue, and it seems to me from present viewpoint that the price might be cut exactly in two, and still leave the growing of the ginseng very profitable

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to any man so situated that he has suitable soil and natural shade of the right quality; but this must be borne in mind, it is no care-free, happy-go-lucky, get-rich-quick scheme. The same elements of success are demanded here that other callings require, patient attention, good judgment and untiring perseverance. Possibly it pays a higher premium on these attributes than some other lines of business, but at the same time it invariably demands them. It will not do to start with great enthusiasm of the quality that is evanescent and slowly fadeth away. So use common sense, a very good attribute in any line of business. You will know, to begin with, that you must wait some time for returns, so your investment must be a conservative one, unless you can readily spare the amount from present operations.

I have stated in part that the acreage required to be produced artificially to offset the destruction by the "Sang" diggers, and by stock and clearing of forest lands, would be something like 150 acres yearly, which means that with a crop that requires not less than a five-year period to mature, that 750 acres should be under cultivation in this country, and with reduced price and doubled demand 1,500 total acreage would be required; and the wild product will soon be insignificant as a factor in the question. How does our actual present acreage compare with such a demand? Careful estimates made last winter placed the total amount of artificial plantings of the United States at twenty-five acres. Rather a small fraction of above estimates. Draw your own inferences.

A MEMBER: I would like to know what kind of soil is required.

MR. HARRINGTON: It is necessary to have an open, porous soil that will not pack down. It ought to be fairly rich. You should have a little leaf mold in it, to make it light.

A MEMBER: When you take the root does it destroy the plant?

MR. HARRINGTON: When you take it out it is gone, certainly.

"Strawberries for the Farmer," the paper read by the secretary, as Mr. Lutton was not present.

STRAWBERRIES FOR THE FARMER.

BY T. J. LUTTON, SOUTH ENGLISH.

Strawberries are to the majority of farmers a luxury seldom seen on their tables and we wonder at the fact when we know that they all have the facilities to produce an abundant supply. My opinion, deduced from experience and observation, is that they do not know how simple and easy it is to raise the berries with such a small amount of time and labor. For the benefit of those who do not grow them, I will give a few directions so as to enable them to make a start. In the spring as soon as the ground is in proper condition is the best time to plant. Prepare the ground as well as you would

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for a crop of corn. Send one dollar to some reliable grower of plants and get three hundred plants of some old and tested varieties. Do not go to some neighbor's old bed, even if you do get the plants for digging them. Lay off your ground in rows six feet apart (you have plenty of land) set the plants two feet apart in the rows, then cultivate and do not let a weed grow. The first season it will not require much time for so small a patch. When the ground freezes, cover lightly with slough hay or straw. By just leaving your old bed alone you will get two fair crops and probably three and enough to supply your family the fourth year. Try it and you will wonder why you have done so long without berries.

LESSON II.

SMALL FRUITS.

C. G. BLODGETT, teacher. I don't believe I can interest these people at this late hour. What varieties of strawberries would you plant for home use?

A MEMBER: I would choose Warfield first, with something for a fertilizer; most anything would do if you got plenty of pollen.

TEACHER: Have you anything else for home use?

A MEMBER: Haverland.

TEACHER: What would you plant for market?

A MEMBER: The Haverland is as good as any for market.

TEACHER: You have not told us yet what you would plant with the Warfield.

A MEMBER: I would plant the Clyde.

TEACHER: They do not ripen at the same time. Have you ever tried the Lovett?

A MEMBER: Yes; I have them.

TEACHER: We will call on somebody who has tried the Senator Dunlap. Mr. Harrington, I believe you have had experience with it. Have you planted it with the Warfield?

MR. HARRINGTON: No; I have not had the Warfield since I had the Senator Dunlap.

TEACHER: You have planted the Senator Dunlap in the Warfield's place?

MR. HARRINGTON: I care more for the Senator Dunlap than for all others combined.

TEACHER. What is a good plant to fertilize the Warfield?

A MEMBER. The Senator Dunlap is larger than Warfield and the quality is better. It is much like the Haverland.

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A MEMBER. I think the quality is better.

A MEMBER. It is not my experience, but doctors disagree very often.

A MEMBER. How would the Bederwood go with the Haverland?

TEACHER. It is soft for a market berry. With me it rusted so that I have discarded it years ago. I have planted the Warfield and Staple, and have had very good success. The Staple is not a very good producer but it is a good fertilizer.

A MEMBER. I was going to ask what you would plant with the Crescent?

TEACHER. I have planted Lovett, and find nothing better. It is a very good plant to plant alone in any section.

A MEMBER. Why should you choose to plant two varieties when you can get plants with perfect flowers?

TEACHER. It has been proved that the staminates are not as good as the pistillate, when planted alone. How many have tested Senator Dunlap and are well pleased with it?

A MEMBER. With me there has been no failing that has not been mentioned. It is a wonderful plant maker and unless watched it sets so many runners that it is not very prolific.

MR. HARRINGTON. That is the one fault I have found with that plant.

A MEMBER: Did you ever try them in hills like corn?

TEACHER: We will get to that later on. I have been cutting runners from seedlings this summer, and I find it a good deal of work. The object is to have each one of these seedlings stand for itself and show the next year what it is.

TEACHER: Who has tried the Nick Ohmer?

JOHN BOWERS: Yes, I have tried it and I like it very well.

TEACHER: We would like to bring out the most prominent varieties. The Crescent is an old standby.

Adjourned to meet Thursday morning at 9 o'clock.

THURSDAY MORNING SESSION.

A MEMBER: I would like to know something about the preparation of the soil. I would like to know if what has been in sod this last summer and plowed this summer could be gotten in shape for strawberries next spring.

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A MEMBER: If you break it in June, not too deeply, and in the fall put a disk on it and plow it ten inches deep in the spring, I think it will be suitable ground for the strawberry.

A MEMBER: I plow it shallow and let it be turned up to the sun until the sod is dry.

MR. WILSON: I planted five kinds last spring on ground broken just the way you mention. I turned the sod real flat, but did not cut it up at all, and had good success.

TEACHER: Have you noticed this fall any little grass coming up?

MR. WILSON: I have not. The ground was plowed last fall, and it had been in sod for a number of years, and I did not replow it in the spring.

TEACHER: Did you have any trouble with the white grub?

MR. WILSON: I did not. Does not the white grub die of its own accord when the decayed matter goes from the soil?

PROFESSOR ERWIN: The white grub has to go into the beetle stage and goes some place else.

MR. WILSON: I have noticed that the white grub wants a soil like sod broken the first time.

MR. GRAHAM: The white grub will accumulate where you use a mulch.

MR. HARRINGTON: I have always found it very good to plant this sod to potatoes the year after it has been broken in the fall, and you will get most of the grubs when you dig the potatoes.

PROFESSOR ERWIN: If you have a piece of ground that they are in, by stirring it in the fall a good many are turned up and frozen.

TEACHER; Is there any soil in Iowa that will not raise strawberries?

A MEMBER: Not unless you would have them in swamps.

MR. VANNOY: What is the best location for a bed?

MR. BOWERS: I should prefer a northeast slope.

TEACHER: Any difference in opinion?

A MEMBER: A southeastern slope.

TEACHER: About the distance apart in planting. There is some difference in opinion about that. Mr. Eden, will you tell us how you plant.

MR. EDEN: I do not raise them, only for my own use.

TEACHER: Mr. Harrington, you have been quite successful, how do you plant?

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MR. HARRINGTON: I have always planted my rows two feet apart and about eighteen to twenty inches apart in the row.

TEACHER: Did you not find it a little close for the past season?

MR. HARRINGTON: You cannot tell just how the season is going to be, in dry weather it is not any too close.

TEACHER: How many would advise growing six feet apart?

A MEMBER: I would consider that too far apart.

MR. FULTZ: What was advised in the paper by Mr. Lutton was for the average farmer, and if he would set them six feet apart he would not have to bother them for a year or two.

TEACHER: Some varieties are better for home use than others. The Crescent will fill more boxes than any other. The Warfield will sell higher than the Crescent, but the Crescent will bring a good deal of money and make a good many quarts. I have not found anything that will take the place of the Warfield. The Senator Dunlap does not do as well for me.

MR. BRANSON: I would recommend the Senator Dunlap for the farmers.

MR. RICHEY: I want to say a little about a new strawberry that originated here. I have tested many varieties and have not found anything better. The originator did not know that there was a strawberry called Santa Claus so he gave it that name. The Santa Claus is not a self fertilizer. They are very fine and luscious. Last year we had a few that were the finest I ever grew. They are large and solid and have not many seeds. They are good plant makers and bid fair to stand at the head of the strawberry race.

TEACHER: How long has it been grown?

MR. RICHEY: About five years, the originator lives near Foster.

MR. BRANSON: In this connection I would like to say that I have several new strawberries, one that I call the Sharon, and one a seedling of the Glendale.

MR. VANNOY: I saw this strawberry of Mr. Woodruff's and can verify the statements of Mr. Richey in regard to them.

THE RASPBERRY.

MR. BLODGETT: I wish some one would take this subject. Now suppose we have the ground right for planting, it is the same for all the berries, good corn ground. If you were going to plant what varieties would you use?

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MR. PAYNE: I believe I would suggest as varieties the Kansas and Cumberland, Souhegan and Gregg.

TEACHER. Would any add to or take anything from that list?

MR. WATROUS: We have about forty acres of raspberries and for an early berry I plant largely of the Kansas, and for the reds the Lotta, Cuthbert and Loudon. The best luck I have had with them is to plant a cherry orchard about twenty feet apart and plant two rows of raspberries between and then cultivate them well. The trees shelter the berries from the sun and the berries help the trees.

TEACHER. You would plant some reds would you not Mr. Watrous?

MR. WATROUS. For the very early reds I would plant Turner, Cuthbert and Loudon. I have various other sorts, but if you plant plenty of these you will get a large amount of berries.

MR. GRAHAM. Do you consider the Kansas earlier than the Tyler?

TEACHER. No the Souhegan is earlier than the Kansas. The Older is a good berry in everything but one and that is it discolors a few hours after it is picked. In red berries the Turner is about the same way. The Turner is good in quality but inferior in size and firmness.

How far would you plant them apart?

A MEMBER. Six feet.

TEACHER. I would plant blacks seven feet apart. Mr. Fultz will you tell us something about the dewberry?

A MEMBER. Has any one had any success with any blackberry except the Snyder?

A MEMBER. Ancient Briton.

MR. HARRINGTON. The past few years I have been using the Mersereau. The berry is much larger than the Snyder and is longer in ripening, and has ripened a second crop almost as good as the first.

A MEMBER. Will it do for marketing?

MR. HARRINGTON. Yes, it is good for marketing.

[Mr. Fultz gave a short talk on the dewberry, but as the same subject is treated in a paper read before the State Society and is published in the proceedings of that society it is omitted here.—SECRETARY.]

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PRINCIPLES OF PLANT GROWTH.

BY PROF. A. T. ERWIN, AMES.

The study of horticulture may be divided into two classes; first, how to do things, and second, the way of the principal. The science and practice. The fruit growers ought to know how and why.

There are several points that came up in the last season's work, one of which is the site and location for the orchard. In selecting the site for the orchard we should give attention to two things. The first is to secure good soil drainage and the second is to secure air drainage. To this point I do not think we give as much attention as we should. It has a value in two or three respects. The matter of frosts, for example. We all know that the cold air is heavier and lies down in the valley. Early in the spring when we have these late frosts, we are very apt to suffer first in the low places, in many places in Iowa the apple crop suffered from the frost at blossoming time. Some of the higher points escaped entirely and we should notice this in selecting a site. In each locality there are spots of that kind that vary in this respect, and by making a study of it we can find the spots most immune from frost for our orchards and small fruit. Now this air drainage in the matter of frosts: If the air is kept in circulation there is not so much danger of frost. We noticed the effect of this in the northern part of the State in the cornfields. The rows next the road were free from frost and back in the field they were badly frosted. The road served as an air passage and kept the air in circulation, but where the corn was thick it had a quiet atmosphere and the frost settled. If you have your orchard on a slope you get the movement of the air.

In the matter of fungous diseases. This past year has been severe. Diseases of this kind thrive best in a moist atmosphere. We have all noticed that in the lowest places the atmosphere is more moist than on higher ground. Just exactly the same way if you plant your orchard in the low places, diseases will thrive. I think at the present time the fruit grower is inclined to depend too much on spraying to combat these diseases. I think we should select land to keep free from them, and the matter of location has a direct bearing in that respect. Another point of interest in apple culture is to keep back the blossom. Very often the trees blossom in the spring during the warm days. I notice this fall a number of suggestions in the paper along the line of keeping back the blossoming tree. In one of our state papers some one suggested to mulch the trees to keep them from blossoming out too early. You can go out in the orchard in January or February and get twigs of the apple or peach and put the twigs in water in a sunny window and they will blossom as well as on the tree in the spring. The blossoms are formed the year before and are ready to open out the very first days of spring. As soon as the air is warm enough it will come out regardless of the root system. Mulching does not affect the blossoms of the tree. Professor Bailey tried a very interesting experiment along this line several years ago. He had a large peach tree growing near his greenhouse.

When the ground was frozen he bored a hole in the greenhouse and put a branch through and it came into full bloom while the tree was outside,

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and that showed that the root and top were independent. There are two kinds of buds, the leaf buds and the blossom buds. If you will examine these buds in the spring they are alike, but about the first of June these buds become separate and some are flower buds and some leaf buds. That is, the flower buds that are going to open up this spring began to form last June.

Question. Does girdling change the leaf buds to fruit buds?

PROFESSOR ERWIN: Yes, if you girdle early enough. In the matter of girdling, the work ought to be done in time to catch the change about the first of June. We have a good many seedling apple trees and we practice this girdling to get the trees into fruit earlier. It is not a thing to practice generally. It is to be used on a tree that does not do its work, but is not to be used on our orchards as a regular practice.

Another thing we are learning in the northern part of the State is to head the trees low. The older practice has been to head the apple trees high. Recently we received a letter from a fruit grower and he said he was growing them without any stem and that he was more successful in getting them headed low. There are several advantages in this. As in the matter of sun scald. If you study the sap of a plant in summer time, it is in a dormant state. The protoplasm begins to move actively when you increase the heat. As you lower the temperature it becomes dormant. As long as the sap is in its dormant condition it is all right but in the spring on sunny days it becomes active and you get a sudden cold snap and it is caught and you get a dead spot on that side of the tree. If you can keep it dormant on these bright days you can prevent sun scald.

I think the modern wood wrappers are a great protection. Wrap them around the stem of your tree to protect the stem and if you bury the wrapper a few inches in the ground it will serve as a protection against mice as well as rabbits. They are also a help in the matter of cultivation in the spring. It requires careful watching to keep from bruising the tree with the singletree, and the wrapper protects from that also. In the low stem tree the part that is the most subject to injury is the stem and the less stem you have the less injury you are subject to. Plants suffer from drying out. The ends are very dry and often shrivel up the limbs. It means that during the winter the wind has stolen the sap. When the head is low they do not dry out so much. If the trees are headed high then the wind gets a leverage at them and they go down. If they are headed low the fruit has not so far to fall and is not bruised. If you are engaged in the fruit business you have to face the fact that spraying is a necessity. If the head of the tree is low you can use the sprayer to better advantage. It is a very different proposition to get up in a high tree with a spray but if the heads are low you can get in a wagon and do very satisfactory work. If the trees are headed low the man on the ground can do the work of two in gathering. Perhaps you are beginning to wonder if there is not something against the low-headed trees. I think the one difficulty is in the matter of cultivation.

It is a very trying thing to attempt to cultivate under a low-headed tree. It makes lots of heavy work. Two or three things make it easier than heretofore. The traceless harness is doing away with part of the annoyance.

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At the present time there are two or three types of orchard cultivators. There is a form of the disc harrow with two wheels in front and handles behind and you can use it close to a tree. I think we have overestimated this matter of cultivation in one respect, and made the problem more difficult and harder than it ought to be. Some people say you should get right under the tree even where they are large. I do not think that is necessary. Take an apple tree, the large roots are next the tree and away out are the fine feeding roots, and the tree is entirely dependent on these to feed it. It is evident from this that the place where the most nutriment is taken up is away out at the end of the roots so you need not cultivate so near to the large trees.

Another point that we noticed this fall was the matter of storing fruit. Early in the fall the local market was well supplied with apples. The soil gives forth its heat more slowly than the air. In the fall of the year when you take the temperature of the soil you will find the soil cooler than the air. The cellar is a poor place to store fall apples in. This fall we carried on some experiments by putting some Wealthy and Wolf River apples in the cellar and left some in the orchard and some in a shed and the ones in the cellar decayed and the ones in the shed kept well. On the Ames market, in September, they were selling at 50 cents and in October at $1 per bushel. Another point in regard to holding the fruit. The thing in winter apples is to preserve the specimen in as good condition as we can. Delay is brought about in two ways. By chemical change or by rot or bacteria. The chemical change goes on very rapidly in a warm temperature, and if you keep the temperature cold you will hold the chemical change in check. Bacterial decay is another problem. The skin is a sort of coating or armor. The bacteria cannot penetrate it as long as it is sound. But when you break the skin and they enter the pulpy matter they take up their work at once. I took a number of specimens of Wealthy that were sound and on part of them the skin was punctured by a large knitting needle which had been dipped in the rotting specimen, and the spores that entered in that way made the specimen go down at once. The thing to do is to get the skin as perfect as possible. You have always noticed if you have wormy apples they do not keep as well and they make a difference on the market. The commission man does not object to the wormy part, but it gives a place for the spores to work. This merely emphasizes the careful handling of the fruit; hand-picking instead of the usual way of throwing into a wagon.

We have a great deal of fruit in this southern district. My native state is Missouri and it is the largest orchard state in the Union. I think that southern Iowa has better chances for orchards than Missouri, and I can give you some reasons for it. They have the root rot and all kinds of rot there. The warm atmosphere furnishes excellent conditions for these rots. Here the drier atmosphere makes your trees hardier. You are not so far north but you can have good hardy varieties and not too far south. It was not thought possible to grow apples in northern Iowa a few years ago. Now one man averages over $75 per acre on a crop of apples. I got a letter from a man at Forest City who has now thirty acres of Wealthy apples and his loss has been slight.

MR. DEWEY: In heading the trees low, how are you going to protect the lower limbs from the rabbits?

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PROFESSOR ERWIN: As to rabbits, if you have a stem seventeen or eighteen inches with wooden wrapper it will protect them, except where there is deep snow. When you have a deep snow I do not know of anything that will keep out a rabbit.

LESSON III.

THE PLUM, PEACH AND CHERRY.

A. BRANSON, teacher: What varieties do you prefer?

MR. BLODGETT: For Henry county I like the Wild Goose for early and later Lombard and Blue Damson. The Lombard with its variations. The English seedling is similar to the Lombard. It does not rot as bad as the Lombard. The Blue Damson made a wonderful crop this spring. I picked them in November.

TEACHER: Have you any other varieties to add?

MR. WATROUS: At Des Moines I would drop the Lombard and Damson and plant the Hammer. If I could have only the one tree it would be the Hammer. It is very valuable for marketing. There is the De Soto and others. But at Des Moines I would rather have the Hammer and Champion for a very late one, and some like Wild Goose. There are two or three dozen valuable market plums.

TEACHER: What varieties would you plant in Washington county.

MR. DEWEY: I would plant the Miner, Wild Goose, De Soto and we plant Europeans and Burbanks. There is little rot in the Burbank. There are but few trees planted there and we do not know whether they will last or not.

MR. MASON: I would like to say a word about the Burbank. I got a good crop this year. The plums were small and when the freeze came it killed the blossoms on my other American plums.

MR. MCDOWELL: I would like to praise the Burbank for southern Iowa. We have had good success with them in that section. The De Soto is doing well with us but the Wolf in about my section of the country does not seem to be doing much. Near Centerville it seems to be doing very well.

MR. DEWEY: The Burbank rots badly with us in Washington county.

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MR. CLARK: The Wolf is the hardiest here and does the best for me. It originated within thirteen miles of here.

PROFESSOR ERWIN: The Milton is the easiest plum to grow at Ames.

MR. FULTZ: Is the Milton earlier than the Whittaker?

PROFESSOR ERWIN: About the same, but the Whittaker is the best plum.

MR. SNYDER: Two years ago when we had a fine crop of plums, I had a good many Miltons in my orchard. When other varieties came in the market, people said they did not want plums, that they were bitter.

TEACHER: Mr. Snyder will you give us the best varieties of plums for Lyon county.

MR. SNYDER: We have some such good varieties that I do not know which are the best. We like the De Soto, the Wolf I would not plant. It is a fine looking plum, is a good bearer, but it is a great deal like the Milton. The De Soto is a good plum for market and the people will ask for it the second time. The Beatty is a good plum and is more sought after than the De Soto. The Whittaker is the earliest plum we can hope to raise and is the earliest thing people will take as an early plum. The Wyant is quite a good plum, a wonderful bearer of fine fruit. The Burbank and Abundance have done well in my orchard and while not very hardy we grow them for their fruit, they are very heavy when they do fruit. I never saw a tree grow such a load of fruit as the Neiman. They were the size of Miners this year.

A MEMBER: What about the Downing?

MR. SNYDER: There were a good many fine specimens but were spoiled by wet weather cracking them open.

MR. LANGHAM: Tell us about those you had at the Marion county fair.

MR. SNYDER: One of these was an English seedling and one the Giant Prune, the other was Shippers' Pride. I got some scions from Doctor Dennis and they were sent to him by Mr. Rowe and he sent them to me to be top-worked into a tree to see what they would do. Mr. Langham saw a bunch of them that I took to the Marion fair.

MR. MCDOWELL: I would like to hear something more about the Beatty plum.

MR. SNYDER: I probably have had as much experience as any one, I was the second to get scions from the original tree.

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I worked a twig into a Wolf tree and when I had some plums I was surprised and delighted. I then began propagating it and we have scattered trees around the country and I suppose most every one has it at this time. It is certainly a better plum than anything we have tried up there.

MR. WATROUS: The Beatty does well at Des Moines. I had my start from Doctor Dennis.

MR. MASON: I would like to name one other variety. It was originated here and is called the Harrison plum. It is a red plum and is an excellent keeper and comes after the other plums are gone.

[Mr. Mason will furnish scions to any one wishing them, that will send stamps to pay postage.]

TEACHER: Will some one give us the varieties of cherries to plant? Mr. Harrington, what varieties of cherries would you plant in Iowa county?

MR. HARRINGTON: Montmorency and Dye House. The English Morello is prolific but I do not like the quality. The Suda Hardy is much like the English Morello. My Montmorency trees are young and not bearing very fully, but I think them very promising. I have many varieties of the Russian cherry but among them the Ostheim is very valuable. One variety which I am growing which is on the Morello type, have not borne very much yet. It is peculiar in its manner of growing and is far ahead in quality of anything I have seen. It is the Tubbs cherry.

MR. BRANSON: I like the Morello and Early Richmond. The Morellos have suffered from fungous growth more than the other cherry trees.

THE PRESIDENT: Before we adjourn I wish to say that local talent will entertain us this evening.

THE POSSIBILITIES OF HORTICULTURE IN MONROE COUNTY.

BY W. C. BRIGGS.

Taking it from the natural conditions and the commercial advantages which exist in Monroe county, the possibilities of successful horticulture are above the average.

In speaking of the natural conditions we must consider the adaptability of the soil and the climatic advantages. Without a doubt our soil is as well adapted to fruit growing as any spot in the Central West, being a rich alluvial

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soil and in many places mixed with sufficient leaf mold to make it especially adapted to fruit growing. The climate we must admit has been rather against us for the past few years, owing to the extremely dry period extending over several years, followed by the last two seasons which have been altogether too wet for the ordinary fruits. The present system being a constant wonder to all that there was any fruit raised because of the heavy late frosts and general unfavorable conditions the season through. But all pessimistic prophesies to the contrary, there has been a fair crop of all small fruit and early apples and an abundant crop of berries. The Damson plum exceeding any yield ever before experienced in this country. Late apples though were almost a total failure. The Janet being the only variety so far as I know that has been near a full crop.

It is not my intention in this paper to dwell at length upon varieties but in a general way giving a few that have been tried for years and found to be adapted to our soil and climate. In apples, we have for early; the Duchess and Astrachan; then the Maiden Blush, Wealthy and Rambo, followed by the Grimes' Golden and the Jonathan for early winter, and the Ben Davis, Willow Twig and Janet for later winter use, then the little Red Romanite fills up the intervening time until apples come again. Of course there are other varieties being developed from time to time that may prove better than these would, but these are what have been tried for years.

Plums of nearly every variety have proven to be a success but more especially the Wolf for early and the Pottawattamie and De Soto for later varieties.

The Early Richmond and English Morello cherries are among the old and tried varieties.

In grapes, the Concord, Worden, Moore's Early and the Niagara. In the small fruits such as gooseberries, currants, raspberries, blackberries and strawberries, every variety known seems to do well, in fact this country is especially adapted to berry culture.

As to commercial advantages, Monroe county fruit growers probably have the best home market of any county in the State. The mining towns of the country, comprising several thousand people, depend largely, if not entirely, upon the small farmer and fruit grower for their supplies, and considering the fact that the miner raises no garden or grows no fruit, and is expected to buy nearly exclusively of the company store, the fruit grower and gardener is always sure of a ready sale at a fair price when he brings his produce to these towns.

There are some few things that the ordinary fruit grower loses sight of. In the first place sufficient care is not exercised in selecting the stock for an orchard, a great many farm orchards have an abundance of early apples which at best only last a few days; then probably there are several weeks that he has no ripe fruit; the fruit grower may have apples almost the year around if he exercises care in selecting varieties; then a great many orchards have little or no marketable fruit, due I think largely to the irresponsible "grafters" among the dealers. If the dealer always delivered what he sold there would be less trouble along this line.

Then I think the system of thinning out the fruit that is practiced in Utah and the Pacific Coast countries may often prove advantageous. We often see a tree overladen with fruit so that none of it will gain any size and there-

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fore be unfit for market. On the coast when the fruit grower discovers too much fruit on a tree he thins it out, letting the rest grow to maturity. Just as a farmer does sometimes when his corn is too thick. As a general thing by a judicious thinning of the overladen trees the yield will not be lessened but the quality will be greatly improved. A prominent fruit man in this country seeing a neighbor's tree just overburdened with apples, suggested the thinning out process to the farmer, who accordingly took a garden rake and proceeded to rake off the surplus apples. Needless to say it did not prove entirely satisfactory in this case.

The older orchards through this section are nearly all past their usefulness, and for several reasons. In the first place a fruit tree will not live nearly as long in our Western prairie country as they will in the more heavily timbered, Eastern states, then most of our older orchards were planted entirely too thick to make a healthy growth after they had attained any size, or the orchard was seeded to grass and the trees allowed to "live or die, survive or perish at their own sweet will." But these things have been remedied to a great extent in all of our late orchards. Taking it all in all I think our country is as especially adapted to general horticulture as any point in the West. Of course we may never be able to boast of such finely flavored apples as the Rhoda Island Greening, The King apple of Tompkins county, New York, or the eastern-grown Baldwin, which are the pride and boast of the New England horticulturist, but I think the most primitive New Yorker may possibly find fruit of any kind to suit his cultured taste in Monroe county.

THURSDAY AFTERNOON SESSION.

WHY ARE SOME FRUIT GROWERS SCCUESSFUL.

BY C. B. M'DOWELL, SEYMOUR.

I have chosen this topic for a paper since many times I have heard the expression "Fruit growing is not a success in Iown." My few years' experience proves this statement untrue.

We should all be proud of Iowa, a land of plenty, where poverty is unknown. Her soil is fertile and farm products are raised in abundance. Rich minerals underlie much of the surface which are constantly being removed and added to our state wealth each year. All this should stimulate the Iowa fruit grower, for where there is prosperity there is a demand, and without a demand there can be no success financially.

Several points are to be considered in successfully operating a fruit farm. First of all the manager must have a knowledge of his business. Horticulture is a science and it requires study to complete the course, but we firmly believe a course of study along this line will yield a profit equal if not greater than any branch of science which one could pursue. But the knowledge of

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the science of fruit growing alone, unless it is put into practice, will be of little, if any, profit or benefit to the planter. Too many people are of the opinion that nursery stock once planted, and only half planted at that, will grow and yield plenty of rich and delicious fruit, on any soil and in any climate, with little, if any, care or attention. There are thousands of trees planted each year by the people of Iowa that are never cultivated, never trimmed, never protected from rabbits, mice or other vermin, never inspected in regard to borers or other dangerous insect or disease, in fact are never seen by the planter until they have been dead for many weeks, or even months, from one of the above causes. Here is the foundation of many a failure. It requires work, good, honest, consistent, hard work and patience combined to make a success in fruit growing. But in what branch or line of business can we succeed without the above essentials? Aside from or along with knowledge, thrift and patience, we must consider a desirable location. Twenty miles from a market without any railroad facilities would be a poor location for a fruit farm. Yet it would be hard to find a point this far from a good market as thickly as our cities and towns are located. One does not necessarily need to be close to a city for there are many small towns which consume thousands of quarts of fruit each year.

This expression is also often heard "I had fruit and could not dispose of it." Such statements no doubt are true, yet this is also true, that good fruit properly handled, and at a proper season, without hardly an exception is always in demand and at a fair price. Fruit of poor quality, in poor condition, is not ready sale, and never will be.

In speaking of the demand there are hundreds of laboring men in Iowa today, who have large families and are not situated where they can raise their own fruit, that must be supplied. Not only the common laborers but a majority of the business men depend on buying their fruit from the fruit grower. There are also many farmers who occupy rented farms and buy their fruit for their families. All these people will buy your fruit if it can be had of good quality and at a reasonable price. Then why not produce the supply here at home for this demand? We have a quality far ahead of the imported goods, since that must be picked in a green condition which destroys its flavor and value.

Neither is there any standard fruit we cannot raise. Apples are raised successfully and in abundance, peaches, cherries, pears, plums, and berries in abundance, what else can we ask for?

Fruit growers and farmers of Iowa couple your knowledge of horticulture with your energy and thrift. Not only your knowledge gained by reading and that gained by observation, but take advantage of your horticultural meetings. Add a little judgment to your work, consider the advantages as they now exist, and the time will soon be here when we will say why are all fruit growers successful? Instead of why are only some successful and others fail?

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THE APPLE ORCHARD.

BY H. F. AYRES, WILTON JUNCTION.

As often as the season for planting comes around we hear the call for information as to the different varieties of apples to plant and how to plant them for best results. What to plant should be largely determined by the locality, as what does well in one locality may not prove a success in another. Through the central district of Iowa we have learned that many varieties that have been planted have not been a success, and those varieties that have been a success are fewer in number than those that have not. The varieties that I would plant for a home orchard are those that are hardy and long lived, and adapted to our soil and climate, and good bearers, not subject to rot on the tree, and good keepers after being packed. The fruit to be of medium size, well formed and of good color, with a rich juicy flavor, and they should hang on the tree until ripe.

In setting out an orchard experience has taught us that a north or north-east slope is preferable, the elevation to be as high as possible, the ground to be moderately rich, with a clay subsoil. The rows should run north and south, and the trees should be set twenty-eight or thirty feet apart each way. Prepare the ground in the fall by plowing and subsoiling, and where your rows are to be make a deep dead-furrow, which leave open until spring. When planting set your trees in the furrow from four to six inches deeper than they stood in the nursery. When planting firm the dirt around the roots and then plow the dead-furrow from both sides. In selecting trees for planting I prefer a two-year-old tree of medium size on its own roots. Extreme care should be taken when selecting varieties to plant. I have visited all of sixty farm orchards in my county this fall, and I find about two thirds of them largely planted with varieties that are unprofitable. A farm or home orchard should have varieties that ripen in succession so as to fill the different seasons. I would plant for summer Tetofsky, Oldenburg, Red Astrachan, Benoni, Chenango Strawberry, Red June and Yellow Transparent; and for fall, Wealthy, Fameuse, Utter, Bailey's Sweet and Maiden's Blush; and for winter, Ben Davis, Northwestern Greening, Allen's Choice, Sheriff, Windsor, Roman Stem, Genet, Jonathan and Fallawater. These are only a few varieties out of many, but we know they are good and can be depended upon. I am not prejudiced against any varieties of apple, and believe most of them to be all right in their proper place.

MARKETING THE PRODUCTS OF THE ORCHARD.

BY W. S. FULTZ, MUSCATINE.

To dispose of the products of the orchard to an advantage is just as important as to produce them. To successfully sell any kinds of fruit it is essential to know the conditions governing the markets in which the sale is to be made and it requires the grower to give that market his undivided attention if he wishes to get the best returns for his product. Usually, but

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not always, a home market is the best and the grower is lucky if he can always have such a market. Fruit that is carefully prepared for market and that presents a neat appearance is much easier sold at a profit than that on which no care has been bestowed. It is a waste of time and labor to care for your orchards, to trim and spray the trees, thin the fruit and gather it, and then reduce it to one-half its value by carelessly preparing it for market. In packing for sale, whether in boxes or barrels, do not face with nice fruit, then fill in with little, knotty, speckled or wormy fruit. Growers are often to blame for the failure to get reasonable prices, because of the careless, not to say dishonest, methods of packing. Where a grower depends largely on his home market it will pay him to establish a reputation and to jealously guard that reputation.

In my own orchard all fruit is graded and each grade is sold for what it is. I have never found any difficulty in selling fruit at the top of the market and in the case of apples that are barreled for winter use, I have never yet been able to supply the demand. During the summer of 1897, when we had one of the largest crops of apples raised in southeastern Iowa, I found it necessary to ship all of my summer apples. They were barreled and sent to St. Paul by steamboat, and when the returns came in there were always orders for more apples. Care had been taken to properly face each barrel and no apples of an inferior quality were allowed to go in when filling up the barrel. The past summer sales were made to the local dealers and barrels were furnished to be filled in the orchard, making the handling of the apples an easy matter. The above is given for the purpose of impressing on your minds the importance of honest packing and the building up of a reputation that buyers can depend upon. Nothing will help the grower to get the top prices and make sales easy as good, honest sorting and packing. Put your fruit in handsome shape and your sale is half made. Picking fruit at the proper time is also an important matter when it is desired to make it bring the highest price. In the case of apples, the Grimes Golden, Jonathan and other apples of that class should be picked as early as their condition and color will admit. Ben Davis, Willowtwig, Genet, and Romanites can be gathered later and in the order named. Use every means in your power to get your apples in the best merchantable shape to enable you to sell to the best advantage.

Most all consumers of fruit buy it by sight, ignoring taste and quality. Big, red apples sell more readily than green or yellow ones, with possibly one or two exceptions, and the price is often higher for the red apples than their quality would demand when compared with some of the others. For this reason red apples are more largely grown for commercial purposes than the others. If we had larger orchards and more of them, we would be better enabled to make sales, as the more fruit we raise the greater the number of buyers will be on hand to buy our fruit and the more competition we have the better the prices. It is easier for the producer to sell a carload of apples than for him to sell a smaller quantity and the community that raises larger quantities of apples will be visited by buyers, while the one that raises but few will not.

Business sagacity in marketing the products of the orchard is as important to the grower as it is to the merchant who runs a store, or the manufacturer or trader. We should not for a moment lose sight of the necessity

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for thorough business management in every department of the work. No work in all the many lines of business needs the quality of quick preception and of perseverance more than disposing of the products of the orchard. The sum and substance of the whole matter is, that good fruit, good measure, and well packed, will always bring the best prices, whether in a year of bountiful crops or of small crops, and when it is shipped the freight is just the same on poor or inferior fruit as on the finest and best fruit on the market.

At the present time there is coming a change on the apple market and the tendency is now toward a demand for more fancy fruit. Smaller packages are sought after and special varieties of superior flavor, packed in improved ways, are finding good customers and this will have a tendency to stimulate the planting of the better varieties.

A MEMBER: I would like to ask what disposition you make of the fallen fruit?

MR. FULTZ: We make two grades of it and sell the second class fruit at Muscatine for about half price. Anything we will not sell as second class are fed to the stock or made into cider.

A MEMBER: What is your best method of packing fruit?

MR. FULTZ: We put in a facing of two rows of apples with the stem down, and fill up about half full with apples and then shake it, then fill up a little above top of barrel and put in the head, and then turn up the barrel and the two layers of apples will be on top when it is opened.

MR. MASON: I have wondered if it would not be well to pack them in bushel boxes instead of barrels.

MR. FULTZ: They might get bruised unless wrapped in paper as oranges or lemons are.

A MEMBER: What size boxes have you used?

MR. FULTZ: Bushel boxes. It takes about one hundred boxes to run my business. We market second-class apples in the bushel boxes.

MR. HARRINGTON: Are you not aware that many of the finest apples that come from California and the East are shipped in packages?

MR. FULTZ: Are they not wrapped?

MR. HARRINGTON: They are not.

MR. FULTZ: My experience is that they will bruise.

MR. VANNOY: How did you discern between No. 1 and 2?

MR. FULTZ: I did the grading myself. It is done by the eye. There is not a specked or defective apple ever allowed to go

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into the barrels when we pack them. It depends on the variety as far as size is concerned.

MR. WRAGG: I shipped both boxes and barrels of apples from New York, home, and the ones that came in boxes came with less injury.

PROFESSOR ERWIN: What press do you use in packing apples?

MR. FULTZ: A screw press.

MR. MASON: I would like to know if any one knows how they affect the sale?

PROFESSOR ERWIN: From what I saw in St. Louis, I think the boxes sell better than the barrels. People, there, live in small apartment houses and have not room to store a barrel of apples at a time. If they had, they would probably spoil before they were consumed. The workingman can carry a box of apples home under his arm, and it does not cost as much. I believe if they are packed in boxes they will sell better.

MR. FULTZ. The manner of packing depends on your market.

MR. BRANSON. Every farmer should have the boxes; they are handy for everything.

THE PRESIDENT: I will ask Mr. Wragg, President of the State Horticultural Society, to make us a speech.

MR. WRAGG: We should give more attention to pruning. We are forming the trees in the nursery expecting that the original start we give the tree will be the tip of it when it is in the orchard. We will start the tree right and then we are going to husband it and do it as well as we can. I am topping them not higher than twenty-eight inches in the nursery. We want every tree we put out to have a symmetrical leader.

While I am on the floor I want to say that we want all our members to come up to our State meeting at Des Moines. I would like to have you enrolled with us. We want your support and hearty co-operation in this work. I thank you, Mr. President, and gentlemen.

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LESSON IV.

THE APPLE ORCHARD.

S. W. SNYDER, teacher: Before we can have an apple orchard we must have a place to put it. I will call on Mr. Harrington to tell us how to prepare the ground for an orchard.

MR. HARRINGTON: I would like the ground that had been in grass several years. There might be soil where it would not be advisable to subsoil. The effect of subsoiling is of several years duration. The ground will pack down but not for considerable time. For the preparation of the surface, when it is in the condition that a good farmer would want it for corn or potatoes, it is all right for trees.

DR. FOURT: I would like to ask why he likes grass land.

MR. HARRINGTON: To keep the surface of our soil open. If you have a soil that has been cropped it is not in proper condition to plant trees in. In grass land you have the nitrogenous matter.

MR. GREENE: I think new land where trees have just been grubbed out is the best, then that which has been in grass would come next.

TEACHER: I believe the soil cannot be broken too deeply. Where an old well has been used to set a tree in, you will notice a long lived and healthy tree. It would be profitable to dynamite the ground where a tree is to be planted.

MR. HARRINGTON: There are places in Wisconsin where they have used dynamite.

MR. SNYDER: I have found it an excellent thing to dig the holes in the fall and leave them open all winter.

MR. MASON: I would like to ask what is the best slope for an orchard?

TEACHER: I would prefer a northeastern slope; however, I would plant an orchard on any slope I had, rather than have none. If we had for instance, creek bottom land, we would want to use different methods than if we were planting on the hills.

MR. MASON: How deep would you plant?

TEACHER: About two feet deep.

MR. MASON: I planted deeper than they were in the nursery and they died.

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TEACHER: I never had them die from being planted deeper than they were in the nursery.

MR. MASON: I think the season has something to do with the planting. There are some trees that want a deeper soil than others. Some grow near the surface. You want to plant the Winesap deep. I do not plant a tree in a place where the water stands. My trees planted shallow do better than those planted deep.

TEACHER: How did you protect them from the freeze of 1898-99?

MR. MASON: I did not protect them.

TEACHER: Those planted shallow froze with us.

MR. FULTZ: It is a question of locality.

TEACHER: Our secretary has given us the gist of the whole matter. Different locations take different methods and we must study our location. What will do in one location will not do in another. The last orchard I planted I planted deeply so they could put out roots of their own, and I know deep planting does well in our soil.

MR. WRAGG: You would not say that deep planting would do well in this part of the state, Anyone planting trees here will have to find out for himself. We have all kinds of soil. We have some very favorable land.

MR. MASON: I think we could be benefited by deeper planting here but we could not plant deep this spring.

MR. GRAHAM: I think that fairly deep planting is not objectionable even here. It keeps them from blowing out.

DR. FOURT: I believe in deep planting. We should have subsoil drainage. I have a little orchard and part of it was subsoiled. I can plant trees in the subsoiled ground just as deep as it is subsoiled. But you cannot dig a hole several feet deep, it will fill with water. Plant the tree as deep as you please if you have subsoiled the ground in the first place so the water will run in and out of the hole, then our trees will not die on account of wet feet as we sometimes say.

MR. MASON: I agree with that statement entirely. Plant no deeper than you have plowed.

TEACHER: We will pass to the varieties. Mr. Blodgett, how many varieties would you plant?

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Mn. BLODGETT: That depends. I would not plant as many varieties in a commercial orchard as in a home orchard. I never planted an orchard entirely as a commercial orchard. My ten-acre orchard was planted when I got the place. There were more varieties there than I would plant for money-making. I would plant very few summer apples unless I intended to ship some distance, as the home market does not demand very many varieties. Will you name three varieties you would plant in a commercial orchard ?

MR. WRAGG: Grimes Golden, Jonathan and Ben Davis.

MR. BRANSON: What would you plant for a home orchard ? The Yellow Transparent, Duchess and the Dyer. I would not plant Snow apples as they scab badly. Wealthies for fall, and the Longfield. It is a wonderful bearer. They will drop if you do not pick them a little early. You can keep them six weeks or so if put in a cool place. I think one Wealthy tree is ahead of ten of the Haas. For a sweet apple I would plant the Ramsdel Sweet. The Ben Davis is also a good apple.

A MEMBER: I would like to plant a few Ingram and hide them away for myself.

MR. GRAHAM: I would not leave out the Duchess.

MR. WATROUS: The Benoni is a fine early eating apple. Fine for children.

MR. GALASPIE: I will speak for the Saint Lawrence. They are a large apple and sell well. I would set them out every time. I would rather have them than any apple I have.

MR. BRANSON: I am in doubt if this is the Saint Lawrence they are speaking of. Think it must be a different variety.

MR. FULTZ: There is one reason why these apples are not raised as they were several years ago. Take the Benoni. A few years ago the markets were flooded with Benoni and you could not sell them.

TEACHER: Will some one tell us what distance apart to plant trees?

MR. WATROUS: Every man has his own distance. If I was planting an orchard I would plant them nearer north and south than east and west. North and south 20 feet, and east and west 30 feet. I would grow a little closer north and south or grow an angle with the 2 o'clock sun.

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MR. DEWEY: I would plant them exactly 26 by 34 feet.

MR. BRANSON: I would plant them 20 by 24 for home, and 20 by 22 for commercial.

MR. HARRINGTON: I have planted 30 feet apart east and west and 15 feet north and south, with the intention that part of the trees will be removed. Some object to this and say that men will not have nerve enough to take out the extra trees when the right time comes. I have put out in my little orchards new varieties alternating with the Ben Davis, and if the new varieties are not satisfactory I cut them out.

MR. FULTZ: Does it not often occur that the trees that die are the wrong ones?

MR. HARRINGTON: If a variety does not fulfill my expectations I take it out and leave Ben Davis.

TEACHER: Mr. Forster, will you tell us how to cultivate the orchard?

MR. FORSTER: I practice different methods. I would use corn the first year and after that you can plant potatoes and small fruit and after several years I would seed it down. I planted a group of Ben Davis trees in sod. That group has caused me more labor and money and is the poorest piece of orchard I have The worst pest for us all is the field mice in our blue grass not plowed up.

MR. MASON: How long would you cultivate an orchard? Would you cultivate it after it came into bearing?

MR. FORSTER: I should cultivate it as long as I expected the orchard to be profitable.

A MEMBER: What would you think of mowing clover and leaving it on the ground. I think our soil here needs some protection. It freezes too hard.

TEACHER: This brings us back to what we were discussing some time ago. If you grow this crop of clover and let it lay on the ground you have a hot bed for mice. You must plant deeply enough to protect the roots.

PRUNING.

MR. HARRINGTON: I believe in doing a little judicious pruning in the spring. The little pruning I have referred to can be done any time.

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A MEMBER: I think the pruning should be done year by year so that it would not be necessary to use anything but a pen knife.

MR. HARRINGTON: I approve of that idea.

TEACHER: I would like to ask, will wounds covered with white lead heal over right from the edge of the cut?

MR. HARRINGTON: They will.

TEACHER: In my own practice I have been prejudiced against paint as it was a poison, and I prefer pruning wax.

A MEMBER: I make a paint of resin and linseed oil.

MR. HARRINGTON: The yellow ocher with oil is what I use.

DOCTOR FOURT: When should pruning be done; when is the proper time?

MR. WATROUS: It should be done just before the frost goes from the ground, or when the leaves are full grown, about the first of June.

TEACHER: I do my pruning when I have the most time, and that is generally in February, on mild days.

SPRAYING.

TEACHER: Is there anyone present who has practiced spraying in the orchard?

MR. VANNOY: I have had some experience in spraying. I believe it is necessary to apple and plum culture.

TEACHER: What remedy do you use for codling moth in apples?

MR. VANNOY: Paris green, 1 pound to 200 gallons of water.

A MEMBER: Do you use any lime with it?

MR. VANNOY: Yes, lime or lime water. If the weather is dry use lime. I have helped spray in Oregon. I have found that you can make 50 per cent more apples that are saleable than we can without it.

A MEMBER: Do you work the spraying pump by hand?

MR. VANNOY: The pump I used was a Wellman, and it was furnished by a tank on a sled.

A MEMBER: At what stages of fruit-growing do you begin your spraying?

TEACHER: Just before the buds burst and afterward, and just before the calyx closes.

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MR. HARRINGTON: I have had a little experience the last few years, and at present am using a power sprayer. With a power sprayer you can get from ninety to one hundred pounds pressure, and the results are very much better.

PROFESSOR ERWIN: Is the force compressed air?

MR. HARRINGTON: It is the Monarch Empire Sprayer. The solution used is Bordeaux mixture with insecticide in it. I had a great deal of fungus disease in my orchard, but after I began using this mixture I had no trouble keeping down the scab. I have never used Paris green. I sometimes used London purple. I am using green arcenoid and I find it better than the other insecticides.

PROFESSOR ERWIN: In the matter of the vine, I do not think it is good to use Paris green without doing harm with it. Regarding the matter of the power sprayer that Mr. Harrington spoke of, I think that some form of compressed air is going to be the best thing in a sprayer. These machines cost about $75. I think it a cheap investment.

A MEMBER: How about dry dust spraying?

PROFESSOR ERWIN: The liquid spray has been used longer and is more successful. If you have insects that eat the leaf I think the dust spray is just as effective. But if you want to fight fungus you must have poison in chemical mixture to kill it.

A MEMBER: Does dry dust affect the codling moth?

PROFESSOR ERWIN: No, it is not as good, but it is better than no spraying at all.

MR. HARRINGTON: I would like to ask Professor Erwin in regard to Bordeaux mixture.

PROFESSOR ERWIN: I think it advantageous to add the Bordeaux mixture. There are several insects and fungus diseases in the orchard and you might as well go after them all.

PICKING AND MARKETING FRUIT.

MR. FULTZ: We use a ladder for picking apples. We have them different lengths and have half bushel baskets with swinging handles. We do our sorting in picking, when we do the work ourselves. When our help picks them they are sorted on the ground by some member of the family.

MR. BLODGETT: I have baskets the same as Mr. Fultz. We pick them all and put them all into two bushel boxes with rope

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handles, and fill the wagon box with these boxes and have the wagon stand near the pickers in the row. They come down from the ladder and empty into the wagon.

Moved, seconded and carried that we meet at Lone Tree, November 16, 17 and 18, 1904.

Adjourned to meet at 7.30 P.M.

THURSDAY EVENING SESSION.

Music—Asbury's Orchestra.

HORTICULTURE AS AN EDUCATIONAL FACTOR.

BY PROF. R. B. SPENCER.

My experience in horticulture does not compare favorably in years with a certain gentleman who had passed eighty milestones in the journey of life. He had become an octogenarian. This old gentleman having devoted most of his years as a gardener experienced a proud moment in his life when after his eightieth birthday he described himself as an octogeranium.

The word horticulture comes from the Latin *hortus* meaning a garden and *cultura* meaning cultivation. Horticulture means literally the cultivation of a garden. This word has assumed a much broader meaning than its Latin derivations indicate and includes the culture of fruits, the culture of flowers and decorative plants, the culture of vegetables, and the growing of ornamental trees.

In this larger field horticulture ranks foremost in supplying the markets of the country with a product which as distinctively marks our standard of culture and living as any other product. The quality of the produce of the horticulturist depends not so much on the perfection of machinery or skill in the division of labor but in the understanding of nature herself.—"God's out of doors."

You who have contributed to the support of this horticultural organization are to be congratulated upon what you have accomplished through persistent efforts for the education of the people in this industrial art. Like every organization which stands for the promotion of some industrial, art, scientific and educational progress, a comparatively few persons necessarily shoulder the responsibility for its success. Since the early history of the state the membership of the Iowa Horticultural Society have been prominent

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in promoting horticulture among the people. The benefit of what has been done in the past foreshadows the progress to come. While the state legislature has made appropriations for the promotion of this culture it could profitably and wisely increase that appropriation. The culture for which your society stands belongs to a very conservative element of our people. (And it is one of the good fortunes of our country that we have this conservative element.) Whatever this element of our people take up is substantial. We may rest assured that it will be permanent. The benefit which we are enjoying through the development of horticulture in Iowa may be largely to the credit of the membership of the State Association with its four auxiliary societies of which the Southeastern Iowa Horticultural Society is one.

To me the cultivation of the garden has a figurative meaning. How many incidents of history, sentiment, inspiration, comfort and resolution have occurred in the garden! It has been the scene of some of the deepest expressions of sympathy and the highest ecstasies of joy. It has suggested some of the richest thoughts of our poets. "A garden is a place of seclusion, of meditation and restful peace." It has been the place of recreation to many a hard thinking man. The garden is inseparable from the rural home. Its paths and by-paths are frequented by the home members hopeful in the planting, cheerful in the growth and expectant in the harvest. How apt the comparison of this figure with the cultivation of the human mind.

For the purposes of this paper education may properly be defined as the act of developing the faculties, the training of men and women for the functions for which they are destined. Education means the cultivation of the taste and imagination or the faculties which derive pleasure from art, science and literature in their relation to nature. Herbert Spencer says that the function which education has to discharge is to prepare us for complete living. In the sense of utility education means the preservation of life and health and the proper performance of the more common industrial labors. Thus defined horticulture is an educational factor.

Horticulture contributes to the supply of a cultured demand. It used to be that quantity of produce was the demand. Production was considered wholly from its economic value. But that day has passed. The markets ask for quality as well as quantity. The people look to the quality of a product as superior to anything that makes it desirable. For illustration we may take manufactured articles the value of which depend upon the skill of the designer and workman. Their value lies more in the beauty and the workmanship than in the quality. The wealthiest nations are those which export a finished product and not the raw material. Its value lies in the character of the transformation made in the raw material.

The character of the transformation measures the skill of labor, marks the culture of the designer and indicates the progress made in the community in which the article was created. To the extent which a product possesses quality it is desirable. Producers enter the markets with their products. Competition arises. Every producer is stimulated to the highest pitch to create an article that will win through competition. This stimulus leads the way of progress and marks the capacity of a people to develop.

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This is educational. It elevates the demand of humanity for that which is more useful. It opens the view of mankind to the possibilities of a higher plane of living.

The transformation which manufacturers are able to make in raw materials is important. But is not the improvement which horticulturists are able to make in their products equally important? Is not a high flavor in the apple and fine quality in the vegetable just as desirable? Are not flowers for which society will pay from fifty cents to two dollars per dozen just as much in demand? While they may not contribute as much in a material way yet they contribute their full measure of enjoyment and add to the home a luxury and standard of living without which things of a material value would be of little importance. And one of the blessings of horticulture is that so large a part of our population may be horticulturists and enjoy its production. It should not be restricted to the rich, or even the middle classes but every workingman should have the opportunity to enjoy its elevating influence.

Horticulture is an educational field. There has been a tendency in the past for young people to seek positions in the towns and cities. Our young people who are acquainted with the tilling of the soil are accustomed to breathing the pure air of the country. They have been physically active and have grown to desire a vigorous life. A healthy body is favorable to an energetic mind. To these young people rural life seems a monotonous routine of labor. It is looked upon too much as a means of living or of getting wealth. The city with its hurry and competition, with its active associations appeals to these young people. They are attracted by the apparent opportunities of law, medicine, teaching, etc. Young people have an ambition to be classed in the professions where they may emulate their fellowmen, where they may be in the eye of the public and perhaps leaders of the public.

Horticulture, as well as farming ranks, according to a scientific standard, with the professions and may well be a profession. Let the young man who seeks an opportunity to study science consider the elements of the soil. Oxygen, nitrogen, carbon hydrogen, and the other elements give him a large field for investigation. Every plant produced by the soil takes from it certain amounts of these different elements. While the various plants require less than twenty elements yet different plants require these elements in a multitude of unlike proportions. If the young man desires to know chemistry let him study what benefit the element of silicon is to the plant, what amount of phosphorous every acre of produce takes from the soil. Whenever the horticulturist sells his crop he sells part of his land. This creates a loss in the soil which must be restored or the soil will finally wear out. The horticulturlist may concern himself in what elements should be restored to the soil. As a student he needs to study the analysis of the soil in order that he may know what plant will thrive best on one hillside and what plant on the other.

Horticulture affords an opportunity for some of the best scientific investigations. It calls for a study of economics in the judicious planting and profitable sale of crops. With these opportunities for practical experiment

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and investiagation, with the flood of high-class horticultural literature, with agricultural colleges which rank second to no others, horticulture dignifies labor and provides a field wherein our ambitious young people may find study for mental discipline as efficient as the study of law, medicine, the Greek or the Latin of our colleges and universities.

Horticulture is an educational factor in developing the æsthetic nature of man. It creates the habit of searching consciously for the beautiful. Dr. W. T. Harris says that the great problem in the industry of nations has come to be the æsthetic one. We would have the horticulturist to enjoy his vocation, to see in the fruits, the plants and the trees the beauty, the harmony, the unity and the creative design in nature. Nature is herself beautiful. If we work in harmony with her laws we may expect the best in what she produces. If her laws are violated we may expect the result in her fruit.

Horticulture enriches your life and mine. The love of it, like love itself, like charity, never fails. The influence of horticulture as an educational factor is seen throughout the country. The farm with its thriving orchards, its burdened vines, its productive gardens, our homes scented and beautified by fragrant flowers, together with our churches and schoolhouses, mark the refinement and public spirit of the community. We see these evidences of higher living and appreciation of nature's gifts in the carefully kept lawns of our towns, the decorated parks of our cities and in the adornment of the farm. "There is no greater artist than the man who beautifies the land on which he lives." For the man who tills the soil we have it in poetry and set to music that he feeds them all. And it can be said also that he may enjoy it all. This appreciation of the beautiful is evident in the public demand for the adornment of schoolhouse premises. Our law provides that there shall be at least twelve trees in thrifty condition on every schoolhouse site. The public desires the neat and artistic arrangement of these premises.

There is a growing sentiment that horticulture should be taught in the public schools. In some states practical lessons in this art are made a part of the regular school work. It is the purpose to call forth the highest being of the child. It may be that arithmetic will not awaken him and that music will. Language may not interest him, but when he gets concrete lessons in nature he has been given one of the most educational factors. The school selects a good garden spot. The soil is carefully prepared as regards the favorable growth of vegetation. The seeds of plants are sown, and as growth progresses new lessons are suggested. Order in arrangement and taste for the beautiful is emphasized with every lesson. This emphasis is used in the schoolroom, in the decoration of the walls and in the conduct of the pupils. It is said that childhood is the fruitful period for the culture of the emotions, the time for the building of the positive side of character. It is desired to foster a love for those things which tend to elevate and ennoble the child's higher life and bring him into harmony with the Author of nature. Horticulture has had a prominent part in this character of education. Horticulture is an important factor in the education of man to appreciate the beautiful, to enjoy the comforts it may afford and thus make life worth the living.

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There is a poem of the gardner which reads:

"He wandereth away and away
With Nature, the dear old nurse,
Who sings to him night an day
The rhymes of the universe.
And whenever the wa. seems long,
Or his heart begins to fail,
She will sing a more wonderful song.
Or tell a more wonderful tale."

HORTICULTURE AS AN EDUCATIONAL FACTOR.

BY PROF. H. C. HOLLINGSWORTH, ALBIA.

The meaning of the term horticulture and the extent of this field has been so clearly set forth in the admirable paper to which we have just listened that it seems superfluous for me to attempt to discuss the subject. Furthermore, a discussion usually implies an issue, but I concur so fully in the sentiments expressed in the paper that an issue seems out of the question. My discussion, therefore, will take the form of a few general suggestions. I have been isolated from the practical work of the farm for almost a quarter of a century. I am sure it would be presumption on my part to attempt to speak authoritively upon any of the questions you have had under consideration. I have, however, during these years been an interested observer of the progress that has been made in agriculture and horticulture. I have seen the old mowing scythe d splaced by the seven-foot-sickle-bar-mowing-machine, drawn by fiery steeds. I have seen the old-fashioned cradle laid aside by the twine-binder. The sulky-rake and cultivator, riding-plow, stacker, steam thresher, and various other forms of labor-saving machinery have come into use to lessen the drudgery of the man on the farm, and give him more time for mental culture and the enjoyment of the genuine pleasures connected with his business.

Improvement in stock, in grains, in grasses, vegetables and fruits have kept pace with improvements in other lines, and today the products of the farm and garden are better and more valuable than ever before. But the end of progress is not yet. With the introduction of rural free mail delivery, interurban electric railroads, and telephone connections, and a better system of making and improving country roads, the desirability of the country farm homes will leap into prominence as never before. The time has come when all the educational agencies of the country should be set in motion. The reason why horticulture has attained the prominence it has is because the members of your society and others have put brains into it. The time has come, however, when we should put horticulture into brains. As an educational factor for the training of the minds of the young, especially in the rural schools, an elementary text-book setting forth the practical facts and scientific principles of the various departments of horticulture, should be incorporated into the course of study. I do not think this association could do a better service for education in Iowa than by putting into operation forces that would eventuate in the establishment

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of a law requiring the principles of agriculture and horticulture to be systematically taught in all the common schools of the State. Much has been done by educators in recent years in the line of nature study, but nature study is a broad term and the presentation of facts are so scattering and unsystematic, that definite results leading to any practical returns is almost out of the question.

Horticulture as a subject of study would arouse interest, awaken a desire to experiment, and would, I think, be productive of immediate benefit in every locality. In fact, much interest has been manifested in school gardening in some of the larger cities. Boston has been experimenting for several years past and successful results have been reported. But the country is the great open field where this work should be begun in earnest. I have been surprised at the limited number of practical horticulturists among the great body of farmers. It is true that the main business of farming makes such demands on his time that the farmer can give no attention to his lawn, his garden, or orchard. When one sees the actual farmer going into the markets to buy his supply of winter apples and vegetables, the conclusion is almost forced that either the said farmer has missed his calling, or has been involved in politics and given his consent to run for sheriff. Why should not every farm have a productive garden, and a profitable orchard, and an abundant supply of small fruit? Intelligent industry properly directed, it seems to me, could bring about this result. It would mean work, hard work—of course, it would, but it would mean reward also. There is something about going into partnership with Nature that I always like to contemplate—the certainty with which Nature keeps her part of the contract. But men must think as well as toil in order to enjoy the profits of this partnership. Too many men are migratory in their habits, consequently they can not make a success of either farming or horticulture, or anything else for that matter. The poet has expressed good sentiment in the following lines:

> "He who seeks but one thing in life and but one,
> May hope to achieve it before life be done,
> But he who seeks all things wherever he goes,
> Only reaps from the hopes which around him he sows
> A harvest of barren regrets,"

It stands to reason that one cannot make a success of very many enterprises. Life is too short for a man to spend his energies on very many lines. The need of the age is concentration instead of scatteration. You men who have devoted your time and thought to the advancement of the interests of horticulture in Iowa, may well feel proud that you have accomplished something. You have raised the standard of appreciation for the products of the garden, the vineyard and the orchard, You have brought to perfection a finer quality of apples, peaches, pears, and grapes, and the luscious small fruits that are being displayed in the markets are enough to make even a banker want to change his business. While the school teacher is trying to lead out the faculties of the human mind and give the young a worthy ambition to be something and do something in life, you are putting before their eyes in the form of object lessons the cultivated products of the orchard and the farm. In these products are unmistakable evidence that nature puts her approval upon human effort If the remark of Emerson that "He who makes ten blades of grass grow where but one grew before" is a benefac-

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tor, be true, how much more is he a benefactor who plants trees and brings to perfection the fruit thereof. I take it to be true that there is great educational value in all this work. There is exercise for head, hand, and heart.

Charles Dudley Warner in his preliminary to that admirable little book, "My Summer in a Garden," says, "To own a bit of ground, to scratch it with a hoe, to plant seeds and watch their renewal of life—this is the commonest delight of the race, the most satisfactory thing a man can do."

When this can be done with intelligence the business of agriculture and horticulture, as was suggested in the paper, rises to the dignity of the professions. I close with the thought that the farm with its latent resources ought to have a greater attraction for the average boy than it does. When his education is turned more in this direction it will be greatly to the advantage of both the boy and the farm.

Following the paper of Professor Hollingsworth were declamations by Miss Lellia Fuller of Albia, and Miss Mable Lyman of Bussey, and music by the orchestra. A paper entitled "Snap Shots" was read by Mr. Langham, and then a short address by President M. J. Wragg, of the State Society. The exercises of the evening closed with the song "Friendship's Holy Tie," by the quartette.

FRIDAY MORNING SESSION.

BEES IN CONNECTION WITH HORTICULTURE.

BY M. S. GRAHAM, ALBIA.

Is it profitable to associate bee keeping with horticulture?

To the above querry we would answer yes, to a limited extent at least.

Bees are as necessary in the economy of nature as birds. They take no life from the plant or flower which they visit, but give life and vigor which comes from cross fertilization.

It is very generally conceded that the honey bee is an important factor in the work of pollinating the flowers of many of our most valuable fruits.

Mr. Eugene Secor says (and we think correctly too) that bees never injure sound fruit. Although this charge has been laid at their door, all credible expert testimony exonerates them. In the first place they cannot, if they would, bite the skin of sound fruit. Their mandibles are not made for cutting like those of the wasp and hornet. When they are thought to be guilty it is generally found on investigation that some other insect or bird is doing the mischief, or that the fruit is decaying from other causes.

In the second place the stuff they get from fruit is not only worthless as food for them but is positively injurious, showing that nature never intended the juice of fruit as food for bees. They never use it or gather it except when natural and proper supplies are exhausted. But aside from this the keeping of bees is profitable from a financial standpoint, and also for the delicious food that is supplied for the table.

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A good strong colony of bees will gather from fifty to one hundred pounds of surplus honey in one season. Five or six colonies well managed should supply any family three hundred and sixty-five days in the year with plenty of honey.

From my own limited experience in apiculture I find that there is something peculiarly interesting, instructive and enjoyable in studying the habits and wisdom of the busy bee.

The modern methods in the management of bees are far more satisfactory than the old box-hive methods, The up-to-date bee-keeper will keep his bees in moveable frame hives and see that all colonies are strong in bees and stores at all times.

There is no reason why the horticulturist and bee-keeper should not be friends. The one cannot live and prosper without the other. Both avocations may be followed side by side without prejudice and with mutual advantages.

If you can adapt yourself to the work by study and observation and learn to do the right thing at the right time you will find bee-keeping and horticulture go well together, but it is worse than folly to allow your bees to take care of themselves, swarm when they please and abscond to the timber and in general do as they please. There is neither profit or pleasure in that kind of bee-culture.

MR. RICHEY: Bees are a help in fruit-growing. We have better fruit on account of the bees carrying the pollen.

PROFESSOR ERWIN: It is not well to spray when the tree is in blossom; it will kill the bees. If you spray when the tree is in bloom it affects the pollen and injures the fruit. You should not spray until after the petals have fallen.

MR. FULTZ: We have never killed any bees by spraying. I do not coincide with the paper exactly, but I am rusty on the subject.

MR. BLODGETT: Do you think the bee can injure small fruit?

MR. FULTZ: I know they can. For two seasons when we packed 200 or 300 baskets of grapes, I did not cover them for a short time and the bees came so thick as to almost drive us out of the building. They cut the skin of the grapes, and we had to repack them. I am satisfied in my mind that the bee is not an agent of fertilization. In 1895 I took the census of all the bees in my township and found 139 stands. Two years afterward I took the same census for the Iowa crop service and found 103 stands of bees. In 1897 I again took the census and found between fifty and sixty stands, and I owned half of them. In 1889 we had a bee-keepers' association. We had 800 stands of bees in our organization. In one year it came down to 139. There was no perceptible difference in all these years in the

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yield of the fruit in the township. We raised just as good fruit. I would not give a cent for bees as agents of fertilization.

MR. WRAGG: Don't you think the bees aid nature?

PROFESSOR ERWIN: I think there is one point that should be brought out. It depends on our local conditions. In Central Missouri you will find a little orchard here and there in the woods and it is very still in such places and there the pollenization is dependent on bees. Here in Iowa the winds keep the pollen stirring. In a greenhouse at Ames we grow cucumbers and tomatoes. You won't get them to set unless you shake them or the wind does it. Something is needed to stir the pollen.

MR. GRAHAM: We have had no evidence that they did break the skin of the grape. It is hard to pack them without breaking them and then the bee can get at the fruit. On the vines they work some but I think the skin is broken by the birds. The Oriole will ruin whole clusters. I do not believe the bees touch the grape until the skin is broken. In regard to fertilization they may be worthless for that.

MR. FULTZ: There is one point I want to make in the question of fertilization. We know it to be an absolute fact that there is not a honey bee on the Island, in Lake Erie. They raise just as good fruit there as any place else. A bee cannot live on these islands as they must have pasturage with flowers from spring to fall. There are islands containing 500 and 600 acres that do not have a bee on them and they raise fruit just as well as any place else. We know that when white people came to this country they had to bring their bees with them, and there was fruit here before they came. I do not believe in an experiment made with a paper sack. I do not think you can take the air away from anything and expect it to grow. What experiments I have made have been made in our own orchard.

MR. GRAHAM: Before bees were introduced into Australia they could not raise clover.

MR. FULTZ: When were bees introduced into Australia? We had a discussion on this subject several years ago in the bee papers and I challenged them to produce evidence to show when they were taken to Australia. It was referred to Dr. Miller. He said he would not want to make an affidavit that there had ever been any introduced. You cannot take a bee to Australia without taking it through the Southern Temperate Zone and that would kill them. They would die when they struck the cold weather. They have only one year's life.

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MR. SNYDER: I have been quite an extensive beekeeper every since I have been in the fruit business. While I do not believe they are necessary in the pollenization of fruit, I think they help. There are so many other bugs and other agencies that we are not entirely dependent on them. It is not a usual thing for bees to work on strawberry beds, but this last summer my bees worked on my strawberries. I know growers who had no bees said, that their berries were not pollenized, and mine close to the apairy were never better.

Another thing, honey is always a good price and you might as well have that much from your own efforts as to let someone else have it. I have noticed that clover fields near our apairy yield more clover than those farther away. One of my neighbors had a field near my apairy and he got a great deal more seed from this than from his other fields. I have pretty good proof that they are in some instances quite an aid in this line.

A MEMBER: I would like to ask Mr. Snyder what variety he would keep

MR. SNYDER: I keep the Italian bee, or aim to.

GRAPES.

BY A. A. MASON, ALBIA.

By request of your worthy director, I give this paper on my experience in the growth and culture of the grape, one of the most healthful and delicious fruits of its season. This paper is not written under the expectation that it will serve as a rule and guide to the expert fruit grower but in the hope that the experience of one common farmer will convince others that there is nothing difficult in the growing of the grape in southern Iowa. For my part, indeed, I believe that the grape will stand more neglect and hard usage than most any other fruit. But I also believe that there is no other fruit that will respond more quickly and generously to skillful and careful treatment. It is a fruit that can be grown on any plat of ground, however small, by planting on the east or south side of barn, shed or fence, utilizing same as a trellis and using strips of leather and a few tacks to hold the vines in place. Such a planting often serves to screen an unsightly fence or outbuilding and also becomes a source of pleasure and profit to the owner.

The ideal location for the grape is a gentle southeast slope, not steep enough to wash under heavy rains but still enough slope to get the full benefit of all the heat, light and sunshine there is. The soil should he dark and rich and should be plowed very deep and worked until it is fine and loose. The rows should be laid off north and south, so that the fruit may get the benefit of both morning and afternoon sun, and the rows should be 8 feet apart and the vines 8 feet apart in the row. Dig the holes deep and

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large so that the roots of the young vine may be spread out and straightened as they naturally grow, and then fill in with fine loose soil, well packed around the roots. No manure should be used at planting time. If the soil needs fertilizing, spread the fertilizer on the surface and give the ground good cultivation until July 1st. After that keep the weeds down with the scythe, if necessary, so that the fallen weeds and the stubble may form a sort of protection for the ground in the severe freezing of winter.

Any time after the leaves fall from the vines, until March 1st, trim or cut off the first year's growth back to three or four buds. In grape culture one should never be afraid to use the knife. No care or attention need be given the young vines during the first winter unless the ground is absolutely bare and unprotected, when a light covering of straw or mulch over the roots will prevent winter-killing.

At the beginning of the second year's growth a trellis can be provided for the young vines by setting posts two rods apart in the grape rows and stringing on them three No, 12 galvanized wires, the upper one about five feet, the lower one about two feet from the ground.

In cultivating the second year allow only three or four canes to grow, trained in a fan shape on the trellis. As the canes reach a little above top wire pinch off the end, the cane will then throw out latterals. We use No. 22 soft wire cut in length of four inches to fasten the vines to the trellis.

I planted 200 Concord vines in the spring of 1865 and gathered fruit from them for thirty years without covering or other protection. Since then have planted and fruited in a small way many varieties and from my experience would recommend as best grape for local market or home use the Worden, Moore's Early, Concord and Niagara. These are the only ones I would recommend for this locality,

A MEMBER: I use No. 22 soft wire to fasten vines to the trellis.

A MEMBER: I would like to know if you would trim off the dead wood in setting out the vines, and how deep you would make the excavation.

MR. RICHEY: With me summer pruning is not a success. The vines that I pruned let in too much light on my fruit.

MR. ROBINSON: I was going to make an inquiry in regard to rising grapes. In California they set them out two or three feet apart. They let their grapes come out from the top. Why cannot we raise them as they do in California?

MR. HARRINGTON: The soil there is different and the growth that takes place there is only a fraction of what takes place here. Their fruit lays on the ground and they have no rain there, but here it would rot, or get dirty.

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LESSON V.

INJURIOUS INSECTS.

W. GREENE, teacher: Insects are divided into two classes according to their manner of taking food. They either suck the juice from the plant or eat its structure. Those which suck juices from the plants we must kill with substances applied to the insect externally. We may kill them by closing their breathing pores, or by some caustic substance that destroys their tissue.

Let us study a few of these insects. The aphis, or plant lice, are among the most common. How may we kill them?

MR. CLARK: Lime and whitewash.

A MEMBER: Kerosene emulsion.

TEACHER: Yes, you can kill them with tobacco water or smoke, kerosene emulsion, fir tree oil and other substances.

MR. WRAGG: If you found plum trees covered with aphis, what would you do?

TEACHER: Who will answer that question?

PROFESSOR ERWIN: I would spray with kerosene emulsion.

TEACHER: You have probably noticed how they attack the snowballs early in the season; the leaves curl up and the flowers are imperfect. If you spray the plants with tobacco water it will kill the aphis. Also treat the plum and cherry trees in the same manner when infested by them, or you can dip the ends of the branch in a pail of tobacco water if you only have a few plants to treat.

MR. HARRINGTON: The spraying should be done on a clear day. Kerosene will evaporate quickly on a clear day and on a cloudy day it may harm the foliage.

MR. MASON: How about the long potato bugs which come occasionally in swarms? They will swim out of kerosene.

TEACHER: I think if they swam out of it, they would die afterward. However, these bugs are difficult to kill. They frequently leave the plants on which the poison has been placed. By spraying the plants with paris green you can kill them, though not so easily as the Colorado beetles.

MR. WRAGG: What would you do with the root aphis?

TEACHER: They are not very bad in this State. Treat the same as other aphis.

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MR. WRAGG: If you received roses, apples and other stock infested with woolly aphis, what would you do?

TEACHER: Dip it in tobacco water; or use the kerosene emulsion.

MR. WRAGG: Would tobacco water be safer?

TEACHER: Yes; I prefer it.

MR. WRAGG: Stock from the South is often infested this way. When these roots are cut the insect is there present; should they not be treated before the roots are grafted, and how can you do it?

TEACHER: Yes; have a tank of your solution ready and dip them in it.

Who will answer the question?

PROF. A. T. ERWIN: I planted out some orchards that were affected with the root aphis. When you receive trees you should see that the roots are clean. Cut out the roots that are badly affected and then dip in kerosene emulsion. I have set out a great many trees in this way and they do well. I have received trees that were badly affected with woolly aphis so there were large knots or swellings on the roots, these should be cut off. This aphis is found on trees above as well as under the ground. I have found them along hedges in the fall.

MR. WILSON: Is the wooly aphis considered a dangerous insect?

PROFESSOR ERWIN: Yes, it is dangerous all right, I do not think it will ever become bad in this state. Farther East and South it is quite troublesome.

MR. SNYDER: I have seen crab trees that were covered with it. Will it spread?

TEACHER: Yes.

MR. LANGHAM: Are there not some methods of fumigation?

TEACHER: Yes, but the methods of fumigation are not practical for the farmers.

MR. WILSON: Do not the aphis attack the young trees more than old ones?

TEACHER: Yes, they work on the tender, growing part of the plant.

MR. WILSON: I never saw woolly aphis on old trees. If they start on seedlings do they not leave the trees when old?

TEACHER: They feed on the new growth. The feeding roots of old trees may be attacked by them.

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TEACHER: We have been spending the time on sucking insects. Now who will tell us of those that eat the plant?

A MEMBER: Where does the curculio winter?

TEACHER: Who will answer that question?

PROF. A. T. ERWIN: In rubbish in the orchard.

TEACHER: How may we kill them?

A. T. ERWIN: By jarring the trees and gathering the insects and by spraying.

TEACHER: Stirring soil when the curculio is going through its transformation will help reduce the number; many are exposed to the air and die from exposure. The codling moth is, perhaps, the most destructive insect to the apple crop. Its life history is of interest and should be better known by orchardists. The moth lays her eggs on the fruit or leaves—these soon hatch and the worm either crawls to the calyx or eats into the fruit at some other place. It is the second brood which does the damage to the apple crop.

Adjourned to meet at 1.30 P.M.

FRIDAY AFTERNOON SESSION.

MR. PRESIDENT: We will now have the reports of the committees.

REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS AND SECRETARY'S REPORT.

We, your committee on President's address and Secretary's Report respectfully beg to say that we heartily commend the suggestions and recommendations of our worthy President and especially in the matter of sending the Secretary of the society as a delegate to the state meeting, and also in calling the attention of this society to the death of our most worthy members H. W. Lathrop and C. W. Burton who have gone to their reward since our last meeting, and that in their expressions of sympathy of our loss they voice the sentiment of this entire body. And it is with sincere regret that we learn that our worthy Secratary, Mr. Fultz, can no longer serve as Secretary, on account of failing health, and that we cannot too highly praise his faithfulness and efficient service the past two years, and truly hope that he may live to be with us many times in the future.

C. G. BLODGETT,
J. C. ROBISON,
J. W. PAYNE,
Committee.

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TREASURER'S REPORT.

RECEIPTS.

December 30, 1902, by balance on hand	$ 34.34
January 30, 1903, by receipts from Treasurer State Society	200.00
March 4, 1903, by life membership	5.00
November 20, 1903, by interest at 4 per cent	8.15
November 20, 1903, by 45 annual memberships	45.00
November 20, 1903, by one life membership	5.00
December 12, 1903, by receipts from treasurer state society	200.00
Total	$ 497.49

EXPENDITURES.

November 20, 1903, Wm. Laughlin, expense at meeting at Albia	$ 10.38
November 20, 1903, C. G. Blodgett, expense meeting at Albia	4.75
November 20, 1903, Abner Branson, expense meeting at Albia	5.65
November 20, 1903, F. O. Harrington, expense meeting at Albia	6.77
November 20, 1903, S. B. Dewey, expense meeting at Albia	7.22
November 20, 1903, S. W. Snyder, expense meeting at Albia	7.70
November 20, 1903, W. S. Fultz, expense meeting at Des Moines	10 50
November 20, 1903, Prof. A. T. Erwin, expense meeting at Albia	10.80
November 20, 1903, W. T. Richey, expense meeting at Des Moines	6.00
November 20, 1903, John Forster, premiums on fruit	7.25
November 20, 1903, F. O. Harrington, premiums on fruit	2.25
November 20, 1903, Chas. H. Stone, premiums on fruit	.25
November 20, 1903, Wm. Langham, premiums on fruit	1.25
November 20, 1903, J. T. Wilson, premiums on fruit	.75
November 20, 1903, J. C. Hindman, premiums on fruit	1.50
November 20, 1903, N. S. Graham, premiums on fruit	3.75
November 20, 1903, Geo. W. Eden, premiums on fruit	4.00
November 20, 1903, W. T. Richey, premiums on fruit	2.50
November 20, 1903, John Bowers, premium on fruit	.75
November 20, 1903, W. A. Roles, premium on fruit	.75
November 20, 1903, A. C. Watson, premiums on fruit	1.00
November 20, 1903, W. T. Richey, advance on secretary's expences for 1904	15.00
November 20, 1903, W. S. Fultz, salary as secretary for 1903	75.00
November 20, 1903, John Forster, expense of hall etc., at Albia	19.50
Total	$ 205,27
By balance on hand	$ 292 22
	$ 497.49

FRANK O. HARRINGTON,
Treasurer.

REPORT OF THE COMMITTEE ON RESOLUTIONS.

First. *Resolved*, that we, the members of the Southeastern Iowa Horticulture Society, thank the good people of Albia and vicinity for the cordial and kindly reception and hospitality extended to us.

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Second. That we gratefully and sincerely thank the young people and the local talent for their excellent music which added so much to the pleasure and success of our sessions.

Third. That on behalf of the members individually, we congratulate the committee on awards and the superintendent of exhibits on the successful issue of their arduous labors so carefully performed.

Fourth. That we extend a hearty vote of thanks to Professors Spencer and Hollingsworth for their appropriate and excellent papers on horticulture as an educational factor.

Fifth. That in the death of H. W. Lathrop, of Iowa City, C. W. Burton, of Cedar Rapids, D. F. Bruner, of Toledo, and Isaac Schooley, of Centerdale, the cause of horticulture has suffered and our society lost true friends and workers. Henry W. Lathrop was one of the oldest members of this society, having assisted at its organization at Iowa City thirty-four years ago, and has attended nearly every meeting of the society during all of the time since that period. He held many of its offices from time to time, and was indefatigable and untiring for its good. C. W. Burton was for seventeen years the efficient secretary of our organization, and the society has been greatly indebted to him for its success during that t me. His untiring energy in the discharge of the duties of the office is well known to us all. For two years previous to his first election as secretary, he served this society as its president. Both these members will be greatly missed in the future meetings of this society. Their minds were well stored with information on horticulture topics. Often in discussions on serious problems effecting horticulture, has this society turned to these departed members for a solution, and always found them ready to help unravel and elucidate the problem.

Sixth. That we extend a hearty vote of thanks to J. H. Johnson, editor of the *Albia Union*, for his interest and material aid in our meeting at this place.

F. O. HARRINGTON,
S. W. SYNDER,
J. W. FYE,
Committee.

MR. MASON: I would like to say just a word in regard to C. W. Burten. We were born and raised to young manhood at Brockton, New York. We went to school together and were in the same society. He was a man to be loved by everyone. I do not think he had an enemy. He came West in about 1865 or 1866. He was engaged in educational work before coming here. He came West and went into the sheep business as a venture. He then took charge of the schools here in Albia and was called to Cedar Rapids from here and there he took charge of their schools for several years. He was an excellent man in every way.

MR. WRAGG: I just want to add a word. I can remember years ago before the State legislature gave us a home, before

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the Capitol was finished, we used to meet about the State, and there were a great many men who were always in evidence at these meetings. The old men were an inspiration, especially Mr. Lathrop. He had a way of inspiring the young men. He pointed to the home as the bulwark of our public institutions. The advice he gave came from a deep fountain of knowledge and experience. I don't think he had an enemy. I certainly feel "How are the mighty fallen." And whenever the sickle of death cuts from among us one so rich in experience and knowledge of horticulture, I feel that some of the boys will have to get a move on themselves if they will fill these vacant places. I feel my unworthiness to fill the place held by Mr. Lathrop. His name will go down in history.

MR. RICHEY: I attended the State Society for the first time about ten years ago. One of the first men I met was Mr. Lathrop. I was but a boy and he seemed to take an interest in the boys. I often speak of him as my father in horticulture. I will treasure his memory as long as I live. I was not so well acquainted with the other brother that has passed away, but I had been associated with him since I have been with the society. I learned to love him. While we cannot fill their places to the letter, we can profit by what they have given us.

FLORICULTURE FOR THE HOME.

BY MRS. NELLIE GREGG TOMLINSON.

This topic is such an extensive one it seems like starting to wander in a large field of daisies. I may gather a bouquet, but I cannot hope to cover the field or surround the subject, and the largest, finest blossoms are sure to remain untouched.

Since the creation of the first woman in the Garden of Eden, the members of our sex have admired the beautiful, and upon us has largely devolved the task of its cultivation. And no more pleasing or exhilarating occupation can be found than the growing of plants, whether it be in extensive grounds and conservatories with modern appliances, or on the more limited scale, of a small front lawn and bay windows, with which the majority of us are more familiar.

Taking into consideration the time and labor expended, no greater compensation could be asked, than to enjoy and gather the beautiful and fragrant blossoms, and through them to disseminate joy and happiness.

For the true floriculturist cannot be a miser and win success. Are we not wholly dependent on the God-given sunlight, air and moisture? And since nature repays so bountifully the close cropping of flowers, can we afford to be sparing in their distribution?

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Our Puritan ancestors carried among their most cherished possessions a few seeds of flowers and herbs, that when they landed on the bleak New England shore they might have a memento of the home land far away.

Very distinctly do we remember our own grandmother's garden with the straight rows of zennies, marigolds, phlox, balsam, four-o'clocks, and ragged-robin. And the grandfather whose time was occupied in the growing of fruit of all varieties, and ornamental shrubs and trees. While following him about from orchard to orchard and propounding the innumerable queries known only to childhood, I little imagined that while observing the mysterious process of budding and grafting there was being instilled into my nature a love for Floriculture which years would not eradicate.

In no one respect is the progress of the twentieth century more apparent than in the advance of Floriculture. Each home and lawn speaks most emphatically of the taste and culture of its owner. The stranger judges us and our town by the appearance of our parks, lawns and streets,

The women's clubs have been instrumental in promoting civic interest and pride, and the result is a general awakening to the need of clean, healthful and beautiful towns.

It is gratifying to note that the farm house and lawn is keeping pace with the progress and improvement being made in all other lines. The old tumble-down fence, surrounding a yard devoid of grass, in which pigs and chickens wandered at will and unused machinery was standing, has been superceded by neatly kept lawns, bright flower beds and graceful climbers, giving evidence that the mothers of the country and town alike realize that the surest plan to keep in touch with the children is to make the home attractive and pleasant.

How cautiously and tenderly we care for the little seedlings in our windows and gardens, and how anxiously we guard them from injury and watch their development.

This is our duty, and we are repaid for our attention by the beautiful plant and flower.

In our homes there are other seedlings—of character; little rosy-faced, bright-eyed children. These, too, must be cautiously guarded, cared for, lovingly studied and trained, and after a while they also will develop into beautiful blossoms—blossoms of character which shall last, not for a season. but throughout all eternity. A single serious thought, then, will convince us how important it is that we should know how to prepare the soil, nurture and guard these seedlings of character. Enlist the active interest of your boys in Floriculture and you have solved half the problem of how their leisure shall be spent. This you can the more readily accomplish since the subject of Nature study has been generally taken up in our public schools.

Taking it for granted that you desire to devote some time and space to the cultivation of flowers, let us begin at once our preparations for next season's work. Make a compost heap in the summer or fall by alternating layers of blue grass sod and fertilizer from the barnyard If the soil is heavy a layer of sand may be added. Repeat until the heap is two or three feet high. When the compost is needed for flower beds or for potting begin at one side, chop down with a spade, pulverize, mix thoroughly and sift through a coarse sieve. If you have a box of this soil in the cellar it will be ready when the March winds are howling around, to plant your pansy,

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aster, verbena and cosmos seed. Just a word as to the variety of cosmos. The early dwarf plants are pretty and profuse bloomers, but are not to be compared with the "Giant of California," one trial of which will convince you of its superiority.

If started early indoors, and transplanted to the warmest place procurable, preferably against a south wall, it requires scarcely any care except the providing of support, and will give a wealth of blossoms which are doubly appreciated on account of the scarcity of outdoor blossoms at this season. The blooming period lasted, this year, from the first of October to November 6th.

There are a number of rare plants which we usually obtain from the florist, which may be raised from the seed with a little extra care. The soil should be especially prepared by mixing one-third soil, one-third leaf mould and one-third sharp sand. Mix carefully and thoroughly and sift into boxes or trays about fifteen inches long and four inches deep, in which holes have been bored for drainage. Procure the best seed obtainable and after leveling and settling the soil, scatter the seed evenly and thinly over the surface and sprinkle well with tepid water. The seed is so small that even a light covering is too deep for germination. Subsequent watering must be done carefully and at just the right time. An old whisk broom may be used if you have no fine sprinkler.

The seed to be sown at this time for summer blossoming are all varieties of begonias, gloxians, coleus, double petunias and geraniums. The following seed for winter blooming may be planted a month later under the same conditions: Chinese primrose, fuchsias, cinerarias, cyclamen and carnations.

In April you may make a seed bed for starting young plants. Choose a sunny location, protected by a wall or tight fence. Make the soil loose and fine and when the trees are starting out in leaf, plant seeds in shallow drills, covering lightly. Petunias, balsam salvias, sweet allyssum, carnations, nasturtiums, mignonette, poppies, calliopsis, nicotina and candy tuft, are are some of the annuals you may grow in this bed and have ready for transplanting when conditions are favorable.

As early in April, as the soil will crumble readily, the sweet peas should be planted. In a well drained location they will grow nicely in a trench about six inches wide and four inches deep. Scatter the seed evenly over the bottom, using one ounce of seed for a sixteen-foot double row. Cover the seed two inches deep by raking in the fine soil from the sides. As the plants increase in growth, the remainder of the soil should be worked in around them and rounded up to provide drainage. Woven poultry netting furnishes an acceptable support. The cultivation should be shallow and frequent. In very dry weather a mulching of lawn clippings will assist in retaining moisture, and by gathering the blossoms freely the blooming season may be prolonged.

The annuals I have mentioned are so easily grown there is no reason why any person cannot have at least part of them another season.

A bed of bulbs is sure to be a great source of satisfaction. Planted in the warmest corner, in the fall, they are the first messengers of spring, and require very little attention with the exception of an occasional resetting. Where economy of space is necessary it is an excellent plan to set out the

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nasturtiums plants in the bulb bed. They require the same conditions and exposure and are sure to bloom successfully. The hardy perennials may be advantageously placed in the border with the flowering shrubs, or, if preferred, they may form an irregularly shaped bed in the back-ground. Unsightly woodsheds or other buildings may by transformed into objects of beauty by a covering of vines. The tubrous-rooted moon vine is one of the most rapid-growing and ornamental; and the Japanese Morning-glory, the Wild-hop, Cucumber and Baloon-vine are always popular.

In selecting the location of your beds, it is well to consider your lawn as a whole and strive to assist nature in beautifying your surroundings by placing plants, shrubs and climbers in the best relative positions. Do not make too many small beds. As a rule each variety of plants look best in one bed. Geraniums of a solid color, bordered with sweet allyssum or phlox, verbenas, salvias, petunias, vincas, each planted by itself in a mass, and suitably bordered by one of the satisfactory bedding plants. Sharp contrasts are desirable, when combinations of color are used. White blends nicely with scarlet, pink or blue, but never allow pink and red placed in the same bed.

Dahlias have been cultivated to a high state of perfection and are as handsome as roses. A beautiful circular bed can be made by starting in the center with ricinus surrounded by a row of the tall growing cannas, followed by a succession of the lower growing varieties, and bordered with coleus.

Let us not omit the ever-blooming, hybrid perpetual, or the beautiful climbing roses. The preparation of the soil for roses is about the same as given for plants, except that manure from the cow stable should be used.

The greatest enemy of roses, the slug, may be banished by a liberal sprinkling of powdered white hellebore, applied after a shower, or when the foliage is wet with dew. J. S. Trigg advocates cutting the rose bushes back in the fall, to within six inches of the ground, and covering with leaves and earth, instead of laying down the long canes as is usually done. Since the next year's bloom all comes on the new growth of wood, this seems an excellent plan.

To those who have facilities for the care of plants in winter, there are many varieties which are of easy culture. It is convenient, though not scientific, to classify house plants into three classes, flowering, foliage and bulbous plants. As representatives of the first class we may give geraniums, gloxinas, pelargoniums, primroses, fuchsias, carnations, cyclamen, begonias and heliotrope. The foliage plants most popular are the coleus, palms, ferns and asparagus. The bulbs best suited for house culture are hyacinths, tulips, narcissi, jonquils, freesias and Easter lilies.

The general culture of these is about the same. A south bay window is desirable, and the atmosphere should not be too dry, or the temperature too high. If well watered and given a sufficient allowance of good plant food, they should make a thrifty growth and give an abundance of blossoms.

The insects which are the cause of most trouble in the care of house plants are the red spider, the green fly and the mealy bug. Any of these if not destroyed will spoil the plant. Fumigation with tobacco may be efficiently used, or the plants may be washed with soap suds, or tobacco water. Dusting with dry sulphur, is perhaps the best remedy for an attack of red

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spiders. Soot or lime may be placed about the base of the plants not infected, and will keep the insects from reaching them.

Chrysanthemums produce many distinct types of flowers, and embrace a wide range of colors. They are the first of the house plants to bloom and are really out of the way before severe cold weather begins. Obtain some of the fine varieties from a florist, in the spring, plant singly in pots, in rather heavy soil, with plenty of drainage. Sink the pots in the earth in a shaded place, and water freely. They should be pinched back the first of June, and again the first of August.

This will make the plants produce many strong and stalky branches. They should be given plenty of good fertilizer, especially when the flowers begin to form. If large splendid specimens are desired for exhibition, it is best to disbud them, leaving only the largest central bud on each branch. When the blooming season is past, the plants should be cut back almost to the ground, and stored in the cellar. When spring comes, divide each one into single stalks and transplant into separate pots with fresh soil. They may be easily propagated from cuttings, but never thrive well when allowed to remain in large clump, year after year.

It is well to remember that no one, however expert, succeeds with plants every time. Success is invariably built on numerous failures. The best way is to study the failures and to profit by them. Each plant has peculiar needs of its own, and if these are studied and sympathetically met, the plant will respond with unmistakable appreciation.

LESSON ON FLORICULTURE.

Prof. A. L. ERWIN, Teacher. After the most excellent paper we have just listened to, I feel that the subject has been pretty well gone over. We will gather up a few of the crumbs.

We will start with sowing the seed. In the growing of plants or sowing of seed there are three conditions which we should have in mind, or three conditions with which we must comply in order to get the seeds to grow. First, To supply the seed with nourishment. Second, To supply it with heat; and third, To supply it with oxygen. You can put a seed in the soil, supply the right temperature there, but if the soil is dry it will lie dormant for a great period of time without germinating. Have the ground pulverized and well watered. Some of the seeds are so small they will not need a covering. One of the oldest and most successful seed growers, Peter Henderson, said that it was a rule of his when he sowed a seed to put his foot on it. We should have the ground well pulverized to aid in absorbing the moisture.

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In regard to temperature. When it reaches a certain temperature it bursts. We should study the character of the different seeds and learn the time to put them out. The sweet pea will germinate at a very low temperature. You must get them out as early as yon can, and get them into blooming before the hot weather comes. Some of the tropical plants should not be planted until later or near the time of planting corn. Their requiring oxygen is something we do not always think about. If you sow seed in a thick clay soil, and water it and have it the right temperature it will lay dormant. In pulverizing the soil we supply the oxygen without thinking of it. If the seeds are sown out of doors and a crust forms it should be broken with a rake to assist the seed in getting up.

The propagation of plants, or growing from slips. One of the first things we want to guard against in growing from a slip is to prevent wilting. On the under side of the leaf are little pores or openings. The atmosphere being dryer than the plant. To prevent the wilting when you cut a slip there are conditions we can supply to prevent it. If the leaf is giving off moisture you can cut off a part of the leaves and it will not give off so much moisture. A good scheme for planting is to have a box in a window and have your box full within about three inches of the top with sand, covered with glass. Sand or charcoal will make a good thing to put your cuttings in. In selecting the right slip you want the young branches and not the old hard stocks. The thing we want in house plants is plenty of flowers. One mistake you make in growing house plants is that you give the plant too big a pot. You get larger flowers in a small pot and not so much wood. When the seedling is started the first two or three months it wants plenty of soil, but when it is two or three inches high, you want to put it in a small pot so that the roots are starved and then the buds will begin to form. If you would take a plant out that was blossoming freely, you would find that the dirt was a ball of roots, If you would put it into a larger pot would get wood growth but not flowers. The kind of soil mentioned in the paper is an excellent thing for house plants. A good garden soil will do very well, but if you have a number it would pay you to take this extra trouble. The roots of the plants require a great amount of oxygen. The more open or porous the pot is the better it is for the plant. It

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is not good to have a plant in a tin can. You should not paint the pot as it closes up the pores.

Water is one of the most important things in growing house plants. In potting you should leave from one-half to one-fourth of an inch at the top for water. The pot if filled with water will be sufficient to water the plant.

As to time of watering you can make no rule, it is a matter of condition. When you do water you must give them enough to satisfy the plant fully. In winter you sometimes water once in two weeks and in summer sometimes every day. As the soil begins to dry out it looks a lighter color. Too often in watering plants a little water is poured on top. It only waters on top and is deceiving for the ground on top is right and the bottom is perfectly dry. With woody plants of any kind we should not keep the ball of earth soaked until it gets sour. This watering is perhaps the most important matter in keeping house plants.

As to the kinds of plants. We want those that require the simplest culture. Some of the easiest are the bulbous plants, tulip, hyacinth and Easter lilies. Any one can grow them almost as well as the florist. With all these plants there are two periods in their life. The growing and resting or dormant period. The flowers come into blossom in the spring and in the fall they die down and lie dormant until the next spring. Now of the bulbs you grow in the house, it is a good thing to put them in the cellar while the roots are forming, and leave them there about two months and you will find they have a good root growth and you can put them in a window and they make the top growth very quickly. When the bulbs are in beds it is a good thing to cover them with pine needles to prevent them from freezing, When we cover any kind of a plant in winter it does not serve the purpose of an overcoat but it prevents the plant from freezing and thawing. It is to keep the ground frozen until after the early thaws. It should be taken off early in the spring after the danger of heavy frosts is gone.

The canna is a very satisfactory plant for the home garden. They are simple to care for. In the fall mow the tops off and put them in the cellar. It is necessary to keep them picked if you want them to blossom freely. When the seed begins to form if you pick it ofi, another will form in its place. In the canna there is one thing important in cutting off the flower stock. As soon as the flowers wither if you cut it off above the joint it will produce another bloom. We sometimes make the

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flower beds too high, and when the dry weather comes on the sun dries it out and when it rains the water runs off, so in making a bed you should get it as near the grass level as you can.

To cut flowers for house use the best time to cut them is in the morning. When the sun gets hot they wilt a little. They will last longer if cut in the morning. A florist always picks them early in the morning. The reason a florist does so much better in growing house plants is that his atmosphere is more moist. Whatever you can do to make the atmosphere moist will help your plants.

As to the insects on house plants. The woolly aphis is one of the most common. To rid yourself of them take a stick and tie a small spone on it and wash them with soap and water. If you have little green plant lice on the leaves put the plant in a box, moisten tobacco leaves and make a smudge or get fir tree oil at the drug store, and syringe it on and that will kill them.

One of the most satisfactory palms for the house is the date palm. It is hardy and does well in any house. Any of them want a south window. It is a good practice to turn your plants to keep them symmetrical.

MR. GRAHAM: Is the variation of temperature hard on plants?

PROFESSOR ERWIN: Yes, it is very hard on them. Just as it is on people. At night if you are afraid of frost if you set a tub of water near them, it will keep your plants from frosting. Another point, in case your plants are slightly frosted, cover them from the sun and let them thaw out gradually.

MR. HARRINGTON: I have tried to keep cannas over winter in a dry cellar. I have kept them successfully only when they were in a furnace room. A cellar cool enough for vegetables is too cool for cannas.

MR. BLODGETT: If they are tied up on the joists under the kitchen it is the safest place. Would the dahlia bulbs be kept the same way?

PROFESSOR ERWIN: Yes, about the same way.

One point I might mention about the farmer's lawn. It should be as simple as possible. In planting our shrubbery and beds to put them along each side and you get a better landscape and it is easier to cut the lawn.

MR. CLARK: Would you use ammonia on the plants?

PROFESSOR ERWIN: It is one form of nitrogen. It causes leaf and wood growth. So if you have a plant that you have

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cut back and want it to make a good strong growth you could use ammonia.

MRS. TOMLINSON: What would you advise in the way of a fertilizer?

PROFESSOR ERWIN: The compost that was mentioned would be very satisfactory. Finely ground bone meal is a good fertilizer. These special fertilizers are not necessary to growing good house plants. Iowa soil is good enough without the application of special fertilizers.

Session adjourned.

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TWELFTH ANNUAL MEETING

OF THE

Northwestern Iowa Horticultural Society,

HELD AT

ALTA, IOWA, DECEMBER 1, 2 AND 3, 1903.

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OFFICERS FOR 1904.

PRESIDENT.

P. F. KINNE ..... Storm Lake

VICE PRESIDENT.

G. B. HEALY ..... Sioux City

TREASURER.

B. SHONTZ ..... Correctionville

SECRETARY.

W. B. CHAPMAN ..... Washta

BOARD OF DIRECTORS.

First District, H. N. Antisdel ..... Milford
Second District, L. A. Clemons ..... Storm Lake
Third District, H. L. Felter ..... Washta
Fourth District, A. W. Hatfield ..... Correctionville
Fifth District, W. F. Steigerwalt ..... Carroll

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LIST OF MEMBERS.

LIFE MEMBERS.

A. W. Hatfield ..... Correctionville
H. N. Antisdel ..... Milford
B. Shontz ..... Correctionville
Donald Hill ..... Storm Lake
P. F. Kinne ..... Storm Lake
D. Unger ..... Storm Lake
L. A. Clemons ..... Storm Lake

HONORARY MEMBERS.

Mrs. Jesse Wilkinson ..... Alta
Mrs. C. P. Cornelinssen ..... Alta
Mrs. Wm. Wilfong ..... Alta
John C. Ferris ..... Hampton
A. B. Storms ..... Ames

ANNUAL MEMBERS.

Anderson, C. P. ..... Alta
Baynum, James ..... Correctionville
Bennett, J. F ..... Storm Lake
Bechtle, C. R. ..... LeMars
Caulkins, A. S ..... Storm Lake
Chapman, W. B ..... Washta
Carpenter, D. C ..... Alta
Dalziel, Geo. A ..... Alta
Erwin, A. T ..... Ames
Fitch, H. H ..... Lytton
Felter, H. L ..... Washta
Griffin, J. S ..... Sac City
Garberson, A. W ..... Alta
Lee, G. W ..... Sac City
Little, E. E ..... Ames
Ludwig, Carl ..... Sioux City
Moffitt, A ..... Alta
Morrisey, P ..... Alta
Pelmulder, C. K ..... Grant City
Smith, John ..... Alta
Scott, Frank G ..... Alta
Van Buskirk, A ..... Alta
Youngstrom, John ..... Alta
Zilman, Wm ..... Alta

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LIST OF PREMIUMS

TO BE AWARDED AT THE NEXT ANNUAL MEETING, TO BE HELD IN ————, NOVEMBER 29, 30 AND DECEMBER 1, 1904.

CLASS A.

Best collection of named apples and crabs	$ 7.00
Second best collection	5.00

CLASS B.

Best collection of named apples and crabs grown by exhibitor	10.00
Second best collection	7.00

CLASS C.

Best collection of seedling apples grown by exhibitor	3.00
Second best collection	2.00

CLASS D.

Best plate of any variety of apples of proved value in the district	.50
Best plate of any variety of apples of probable value in the district	.25

CLASS E.

Best plate of seedling apples not previously exhibited	2.00
Second best plate	1.00

CLASS F.

Best collection of canned fruits	2.00
Second best collection	1.00

The same fruit will not be awarded two premiums. Exhibitors will properly label varieties and file with secretary a full list of varieties in each exhibit. If exhibits are small and unworthy of premiums offered, the committee may make a smaller award or none at all. The successful exhibitor must become a member of the society before the premiums will be paid. All exhibits must be grown in the district and all new seedlings must be accompanied by origin, history and nature of soil and conditions in which grown.

Special premiums will be given for plants and flowers.

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PROCEEDINGS

OF THE

Twelfth Annual Meeting

OF THE

Northwestern Iowa Horticultural Society

HELD AT

ALTA, IOWA, DECEMBER 1, 2, AND 3, 1903.

The Society met in the Presbyterian Church with President Kinne in the chair. The district reports were given, of which the following is a summary:

Mr. Antisdel for the First District, reported the berry and the apple crop above the average. Early apples a heavy crop, free from blemishes and of fine quality. Later apples, such as Wealthy, Plumb's Cider, and Kaump, were scabbed. It was a year par excellence for the Russian apples; they were in evidence in nearly every orchard. But few cherries; Early Richmond did fairly well on high locations. Plum crop light, not enough for home use. Blackberries above the average. Strawberries a good crop. Hailstorms did much damage in the western part of the district. Although the season has been extremely wet, trees have ripened their wood to the extreme buds.

L. A. Clemons, of theSecond District, gave report from all counties, except Sioux, where he was unable to obtain a correspondent. Lyon county, through J. H. Johnson, reports a heavy crop of apples, one orchard of six acres giving a crop of one thousand bushels, mostly Duchess and Wealthy. The Milwaukee promises well, a hardy tree and an early, heavy bearer. Plums almost a failure; cherries fruited well; strawberries a big crop;

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of the newer varieties, Dunlap and Sample are of the best. M. De. L. Parsons, of Kossuth county, says scab was more prevalent than ever before, affecting nearly all varieties of apples, except Gano, Jonathan and Grimes Golden. Mr. C. D. Price, of Palo Alo county, reports favorably of all fruits except stone fruits. Mr. R. W. Carson, of Clay county, says the apple and strawberry crops were above average. Mr. F. C. Wheaton, of O'Brien county, reports destructive hailstorms over the whole county, destroying grain and fruit, except in a small area in the east central part, where there was a heavy crop of fine apples.

Mr. H. L. Felter, for the Third District, reported yield of strawberries above all expectations, growers finding it difficult to get enough boxes and crates to handle the crop. Apples above the average in most parts of district, but many varieties affected by scab. Plum crop very light; of native varieties, Hawkeye, Wyant, and Rockford gave some fine fruit. In favorable localities the Burbank bore a good crop of well-formed fruit. Grapes, where properly handled, did well. More attention should be given to grape culture.

Mr. A. W. Hatfield, for the Fourth District, reported a heavy crop of apples, strawberries and blackberries; grapes and dewberries a fair crop, of good quality; currants and gooseberries a light yield, and cherries and plums nearly a failure. The growth of plants has been greater than for many years, and all plants, trees and shrubs have gone into winter quarters in fine condition.

MR. STIEGERWALT: Early varieties of apples were not much troubled with worms with us, but late kinds were; hardly a perfect Ben Davis. I think we must spray and in a systematic manner.

MR. KINNE: We have been troubled less than usual, drowned out, I think.

MR. HATFIELD: With us late varieties were quite wormy.

MR. FELTER: Most varieties quite free from worms, but badly scabbed.

MR. WAYNE: Apples in Sac county were quite free from such defects, but I think spraying will have to be done here soon.

MR. HATFIELD: I sprayed for six years but have neglected to do so the past two years and as a result the quality of my apples has been much poorer. I shall get the best pump I can and go at it next year.

MR. DAY: I sprayed one season and did not have much trouble; the next year I did not spray and the apples were of

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poor quality. This year our apples are scabby. On the whole I think it pays to spray. We have got to make a business of it and make spraying universal.

MR. BORDNER: We have been troubled with leaf rust and blight, but our apples are usually free of worms.

MR. BECHTLE: Our apples are not seriously affected by worms, but some varieties, such as Harry Kaump, scabbed badly.

MR. FELTER: Do you recommend the dust spray?

MR. SHONTZ: I bought a dust sprayer last spring and I like it. It will do five times the work of the liquid sprayer and I believe it is just as effective. I used it for strawberry rust and on the cherry trees for leaf spot. Some trees I failed to spray and the difference was quite marked.

MR. CLEMONS: What do you spray with?

B. SHONTZ: Bordeaux mixture; also Paris green and lime.

REPORT OF DELEGATE OF THE NORTHEASTERN SOCIETY.

BY A. W. HATFIELD, CORRECTIONVILLE.

Your delegate appointed by our president to attend the Northeastern Association, which convened at Nora Springs, December 16, 1902, reports that this meeting was very interesting to him. The program pertained to that part of horticulture which is the most essential to the northeast. We found our brother co-workers very friendly and congenial, and everyone was interested in the good work which we all unceasingly labored to accomplish. Mr. J. W. Moyle, the delegate from Wisconsin, spoke of the young men taking hold of the work in their State and commented upon absence of young men at the meeting. He also stated that the fruit growers of Iowa were growing more fruits for commercial purposes than they do in Wisconsin. He spoke very highly of the Windsor apple, saying it was a heavy bearer and would keep until February. Mr. Mitchell attacked the Patten's Greening apple and gave it a bad rating among other varieties and the criticism brought on a very heated discussion; however the apple proved to have a few friends, but Mr. Patten was on the ground and defended his apple as few men could.

The fruit exhibit was exceedingly large and the greatest collection of so-called seedlings that I ever saw, but your delegate would call a great many of them the Russian variety, and all had been kept in cold storage. The Plumb's Cider and Wealthy apples were very highly spoken of. Professor Moyle, of Wisconsin, would entirely discard the French crab stock. He claimed that the Duchess worked on that stock amounted to very little. He also claimed that using scions from the nursery row was antagonistic to success, and by so doing you cannot tell what you will get, but scions cut from good prolific individual trees will be especially valuable.

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Your delegate saw two rows of white pines a half mile long that had been planted thirty years, and the trees would make good sawlogs, measuring from sixteen to twenty inches on the stump. They were planted six feet apart in the row and the rows were six feet apart, and were planted in ground similar to ours here. The two rows were very beautiful through their entire length. Your delegate also visited the Charles F Gardner nurseries, and would like to say that it is one of the finest places that I have seen in the north part of the State. The program rendered by the citizens of Nora Springs was good, the finest of music, speaking and essays. Owing to the heavy snow and the condition of the roads, the attendance from the country was not very large. All in all, we regarded this meeting with much interest, and we trust that what we are battling for will in the near future be won.

MR. FELTER: From the discussion, what impression did you get of Patten's Greening?

MR. HATFIELD: After hearing the discussion I would not recommend it for a winter apple; very good in its proper season; a fall apple, was the general verdict, hardy and productive.

MR. STEIGERWALT: I heard favorable reports of it in Minnesota and it seems the farther north we go the better it is liked. Professor Green is so in favor of it that he has had it put on the Minnesota list. It is not considered a late keeper but its hardiness, quality and productiveness are in its favor. Professor Green recommended it for some of my friends sixty miles north of St. Paul.

MR. CLEMONS: I have had some experience with it and think it the best of any variety I have. It is a large, fine fall apple. I recommend planting it to some extent.

The treasurer made the following annual report, which was referred to the finance and auditing committee:

TREASURER'S REPORT.

December 1, 1902.	Balance on hand	$171.34
December 1, 1902.	Membership fees	45.00
December 1, 1902.	State appropriation	200.00
	Total amount received	$416.34

MONEYS PAID OUT.

December 4, 1902.	Stauffer Brothers, printing	$ 5.50
December 4, 1902.	H. L. Swift, printing	6.19
December 4, 1902.	A. T. Erwin, expenses at Sac City meeting	8.08
December 4, 1902.	W. Greene, expenses at Sac City meeting	8.00
December 4, 1902.	E. Reeves, expenses at Sac City meeting	10.82
December 4, 1902.	H. C. Price, expenses at Sac City meeting	8.00

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December 4, 1902.	M. J. Wragg, expenses at Sac City meeting....	6.00
December 4, 1902.	Chas. E. Griffin, expenses as director.....	9.41
December 4, 1902.	P. F. Kinne, expenses at Sac City meeting.....	1.60
December 4, 1902.	W. B. Chapman, expenses at Sac City.....	8.20
December 4, 1902.	P. F. Kinne, salary president.....	20.00
December 4, 1902.	W. B. Chapman, salary.....	75.00
December 4, 1902.	A. J. Stevens, janitor.....	3.00
December 4, 1902.	Mrs. C. A. Nokes, premium.....	5.00
December 4, 1902.	D. Hill, premium.....	10.00
December 4, 1902.	B. Shontz, premium.....	3.50
December 4, 1902.	A. W. Hatfield, premiums.....	11.50
December 4, 1902.	D. Hill, premiums.....	2 50
December 4, 1902.	C. K. Pelmulder, premium.....	1.00
December 4, 1902.	B. Shontz, premium.....	3 50
December 4, 1902.	W. B. Chapman, premium.....	.50
December 4, 1902.	G. R. Barrett, hotel bill.....	21.75
December 4, 1902.	H. N. Antisdel, premium.....	.75
December 4, 1902.	L. A. Clemons, premium.....	.50
December 4, 1902.	W. M. Bomberger, expenses at Sac City meeting.	6.27
December 4, 1902.	A. W. Hatfield, expenses as delegate to Nora Springs..	18.50
	Balance on hand December 1, 1903.....	159.77
	Total to balance.....	$416.34

B. SHONTZ,
Treasurer.

PRUNING FRUIT TREES.

BY W. F. STEIGERWALT, CARROLL.

The old axiom, "as the twig is bent the tree is inclined," is literally true on the subject of pruning. The phrase is sometimes applied to the human race. The uncouth boy, we say, is not properly pruned—physically and morally—hence the man is illy inclined.

There is no question that the very first care and proper start of a tree is in the nursery row. If the tree is neglected there, and not properly started it will come to the planter in an ill shape, that is almost impossible to change. The proper shape of a tree is one with a central stem, a leader on the top with a terminal bud. This central stem should have a circle of limbs at regular intervals. This will give a cone-shaped symmetrical tree that will be a delight to behold. Of course it is not the nature of all trees to be thus shaped, but if one nurseryman can properly start certain varieties in symmetrical form other nurserymen ought to be able to do the same thing, if not, they are not masters of their business.

We will suppose that the nursery stock received all proper care from the time of digging the trees to the time of planting permanently in the orchard. If the trees need cutting back or the removal of any limbs, this can be done even after the tree is set, but the roots must have immediate attention. Every tree should have a circle of brace roots from eight to twelve inches

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long. The ends of all roots should be cut off a little and especially all broken and injured roots should be removed with a sharp knife or pruning shears, just before planting. A fresh smooth cut will callous much quicker and start feeding roots much sooner. A good supply of roots will support an ordinary tree, but if the roots are limited, the tree should be cut back in proportion to the roots. These principles will apply to all trees and plants.

Thrifty two-year-old grapevines sometimes have roots two feet long. Such vines are hard to plant, and the long roots are a detriment to the plant. These roots should be cut off to about six or seven inches and covered with fine rich soil.

The heading of trees has two sides. The low-headed tree has the advantage of being a protection to some extent against sun scald, and in case of the cherry the fruit is much easier gathered. Low-headed trees are undoubtedly of longer life, but close cultivation with horse and cultivator is decidedly against low-headed trees.

No iron-clad rule for pruning can be laid down that will apply to all conditions. Local environments, such as climate, soil, etc., govern these conditions. A few general principles, however, will apply to all. No limbs should be allowed to cross each other so close as to rub one upon the other when loaded with fruit. The heaviest limbs that are to remain on the tree at the time of planting should be to the southwest for the protection of the tree.

Cherry trees, when properly started, require very little pruning, simply the removal of dead limbs. The Duchess trees do not require near as much pruning as the Wealthy and Ben Davis; the latter, when left alone a few years, will have a thicket of water sprouts through the center that is very unsightly and injurious. All unnecessary sprouts that start should be removed as they appear during the growing season, and the wounds will soon heal. Where limbs have to be removed, of an inch or more in diameter, the wound should be painted with white lead.

Some plum growers advocate that at least one third of the previous year's growth should be removed, and even more, of such varieties that are apt to overbear.

It has almost become universal with peach growers to remove half of the previous year's growth. This will lessen the strain on the tree when bearing a crop of fruit and prolong the life of the tree. This cutting back should be done the last week in August or the first week in September. This will have a tendency to develop fruit buds, ripen the wood, so that the trees will shed their leaves in the fall the same as other trees, and become hardened, so that ordinary winters will not injure them.

Old declining fruit trees, with partially dead limbs, can be rejuvenated by cutting off the limbs about a foot from the trunk of the tree allowing new wood to start up, which will soon come into bearing.

It is almost painful, in going through the country, to see orchards of bearing age and up to thirty years old entirely neglected, the trees never having been touched with the pruning knife. Surely, the owners can buy their fruit cheaper than they can raise it, if first cost is not considered.

In conclusion, I will say that eternal vigilance on all these lines of care of trees will give us the prize of good fruit.

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MR. HEALY: You favor light pruning of cherry trees; how about cleaning out thicket on the inside?

MR. STEIGERWALT: The cherry begins to bear three or four years after planting, and most of the growth is before that. After it begins to bear it requires little pruning.

MR. HATFIELD: I have some old Early Richmond trees that have never had a twig cut. The Early Richmond needs no pruning.

MR. KINNE: It is generally considered that the knife should be kept off the cherry tree. It makes a wound and results in decay.

MR. DAY: I observed long ago that trees let alone were the best trees in Iowa, and I have followed the let alone policy to my profit. All pruning should be done when the tree is quite young. Head just as low as possible; no trouble then with the bark; no sun scald. Trees headed low look best, bear best, and are best.

MR. STEIGERWALT: There are two extremes to everything. The pruning should be done when the tree is small. I go through my orchard several times during the season and trim without a knife in most cases. I believe a tree should be trimmed; if not, it looks like a boy who has never had his hair cut.

MR. DAY: I am in favor of pruning, but at the proper time, and that is when the tree is very young. Do not trim a tree after it is well grown with big limbs. The younger a tree is put into the orchard the better tree you will get, more shapely, healthier and better bearer.

MR. HEALY: I find there is about as much difference about pruning as there developed at our last meeting about the proper slope for an orchard. In Nova Scotia, where I was reared, there is a lack of sunshine; here we have a superabundance. There the middle of the tree is kept clean and the fruit grows on the outside entirely. The owner of a little orchard in Sioux City trims the center of his trees every year and has raised not less than 600 bushels of apples in an orchard of less than an acre. I know of another fruitful orchard near Sioux City that has never been trimmed. Now I want to know what to do with my orchard?

MR. KINNE: Mr. Healy has practically answered his own question. They clean out the center of a tree in Nova Scotia, and force all the fruit to the outside, because they lack sunshine

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and have much moisture. Here the opposite conditions usually prevail—lack of moisture and a superabundance of sunshine. Hence, we head our trees low and trim sparingly.

OUR FRUIT BELT.

BY H. L. FELTER, WASHTA.

The bountiful apple crop in this part of Iowa will do much to encourage the planting of larger orchards.

The fruit belt has extended west as far as sufficient moisture is had to make any kind of a tree grow.

Commercial fruit growing has as yet been carried on to but a limited extent in northwest Iowa but enough has been done to prove our capabilities in that direction. Mr. Hale, of Connecticut, says that peaches will yet be grown wherever corn will make a good crop, and Secretary Greene reported growing peach trees in every county in the State except one. Surely if a peach tree will grow we may be very certain that the hardier fruits will do well in any part of the state.

The largest apple orchards are in the southwestern portions of the State and the principal apple districts are largely along the banks of the rivers, especially in the counties near the Missouri.

In talking of the Little Sioux district, I have the opinion of such men as Professor Budd, Captain Speer, W. H. Guilford, Professor Craig, and Mr. Bomberger, who have studied the conditions, that this is almost an ideal orchard country.

It seems that our trees are much less troubled with blight, borers, and root aphis than those of the Ozarks.

When we look around we find old trees of Ben Davis, Genet and others that we have heard called tender, now in heavy bearing.

I know of many that have these varieties and call them very satisfactory. If such trees succeed in so many places we may take the recommended list of the Northwestern Iowa Society and grow apples in abundance and call this an apple country.

MANAGEMENT OF AN APPLE ORCHARD.

BY L. A. CLEMONS, STORM LAKE.

The management of an orchard is conducted under so many conditions that it is difficult to lay down any set rules that will apply to all localities. Soil, humidity and aridity of the air, length of the different seasons, degrees of heat and cold, with many other things that might be mentioned are all factors that enter into the problem of orchard management. I shall only refer to such points at this time as in my experience seem desirable.

First, setting an orchard. The ground should be well cultivated the year previous to planting, say in corn, potatoes or some hoed crop; in the

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spring remove all trash and burn the same. Space the rows each way, take a walking plow with good stout team and open a dead furrow exactly where you want your row of trees to stand; go down and back with plow leaving enough of unturned soil between the first two furrows to make a third furrow. In making each furrow set your plow as deep as your team can pull it; have your trees ready to set while the furrow is still moist, train the roots from the under side, having all smooth and nice. Then remove the loose dirt from the bottom of the furrow where you want your tree, setting the tree on the solid subsoil beneath the top soil. Now cover the roots with moist top soil, working the dirt among the roots and tramping down solidly as you fill in. When you have your row set, take one horse and plow, turn all loose dirt back into the furrow, then with your double team go around each row two or three times turning the soil towards the row. If your trees are in good condition when set all should grow.

Second. Cultivate them as thoroughly as you would a hill of corn for three to five years, never sowing small grain of any kind in the orchard. Sow down to clover, giving it all the ground and cultivate the seed in well, leaving the surface smooth and nice. Do not mix grass seeds with it; allow the clover to occupy the ground as long as it will; do not pasture it but mow it down leaving all of it on the ground as it fell from the mower; allow the aftergrowth to stand and die down for winter mulch and to hold the snows of winter evenly over the surface.

Third. Hill up your trees each fall before the ground freezes from ten to eighteen inches, putting your first shovelful of dirt on northeast of tree and do not forget to leave a good mound about them when you seed to clover. Do not leave any holes about the stems of your trees. I consider this one of the most important things to be done in the management of a young orchard under cultivation.

Fourth. Have your trees limb out low down, not more than eighteen inches above the surface of the ground. Trees of good size trimmed up from four to six feet high when set will have a hard road to travel, and are always of doubtful value. Trim but little, if any; as they get older take out dead branches, and you will then have done about all that is desirable along that line.

Fifth, about spraying. I have had no personal experience and will leave that for those who have to discuss. However, every effort should be made to keep an orchard free from injuries, such as insect and fungous diseases.

If any tree shows signs of failure or receives serious injury, such as would be likely to impair its future usefulness, remove and reset with a good tree, unless the injury is entirely above ground; if so saw off below the ground and regraft between wood and bark; now thoroughly replace the soil to near the top of ground in case of old trees that prove undesirable either in tree or fruit, remove in the fall, digging a large hole and reset in spring with something that gives hope of better things.

After following the above methods for several years I am now able to eat my own apples and have a few to sell in their season.

Go do likewise and be happy.

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MR. WAYNE: I am skeptical about Mr. Clemons' method of setting trees. The most successful way I have found is to dig a big hole and deep; the other way the tree is likely to dry out in a dry season.

MR. CLEMONS: I do not favor shallow planting; I always set a tree down to the clay; if two feet down, go to it. I do not favor shallow planting in northwest Iowa.

MR. STEIGERWALT: I agree with Mr. Clemons in making a deep furrow with the plow; it saves a great deal of muscle. It requires but little extra work to make ready for the tree. But I never before heard hilling up a tree advocated. I think it best to have a basin to collect the moisture and fill in gradually in cultivating.

MR. CLEMONS: Hill up in the fall only; then work the dirt down the folowing season.

MR. FITCH: What is the object of the mound?

MR. CLEMONS: To keep the mice away and to steady the tree.

MR. DAY: A good thing, no question about it, in any soil. For the rabbits wrap burlap about the tree.

MR. HEALY: About setting trees deep. In the loess soil along the Missouri I have set deep, six or seven inches deeper than in nursery. Some of these trees died out this year and I find all the lower roots were dead, and the tree had put out new and higher roots.

MR. WAYNE: Deep planting is better because the tree roots are below freezing and thawing, and are not likely to suffer from drouth.

PRESIDENT'S ADDRESS.

Our meeting at Alta is emblematic of our ambition to go higher, Alta being the highest point the Northwestern Horticultural Society has yet attained. We meet this year at the highest townsite in the state, and stand where we may look back and down upon the work of the past twelve years. We have only to look a little way down the valley to see where we made our start at Cherokee. The faces of the organizers of this society are not all with us. Those that have gone beyond have left with us memories that have guided us to truer and better work. Their part was well done and their helpful work has left with us an inspiration to better things in the future. This love of flowers and fruits and plants has not a trace of the grosser part of man, but appeals to all that goes to make up his finer nature.

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Show me a child that loves the flowers, the birds, the trees and I will show you one that rarely goes behind the bars. Again show me one who only sees enjoyment in a dog fight or the angry spit of the cat, and you find one who needs a steady, skillful hand to rear, so that men and women are proud to own companionship with him. What we have been we know, what we may be spreads before us in unwritten pages. I would that I might read these pages from this high place at Alta; but I do see before me yet a higher point. *May* we, *can* we reach it! Twelve years, as I look back, have accomplished much along horticultural lines. We have seen within that time ninety per cent of the fruit shipped in. This year we have seen it shipped out of Alta by the car load. This is encouraging, and makes us feel good. The croaker, who used to say we could not raise apples on these wind-swept prairies, has crawled so far back under the seat that we cannot get him with a telephone pole, and he will *stay* there, for the future promises much more than the past. We now ship in most of our winter apples, but the time is near at hand when winter apples will go *out* instead of *in*, and to that end we are met here at Alta, not to see who can tell the biggest lie but who can tell the biggest truth. All *may* swap lies but we want to swap *truths* until we get down to the facts in the can and find the golden nugget we are all looking after. One safe way to find that nugget is to plant more fruit, and the object of this society is to find out what to plant, and to this end we want your help and experience. We want you to be *one* of us to the final end that we may make of this a veritable Garden of Eden. The past season has taught the horticulturist many lessons and one peculiar thing about this line of work is that from year to year the conditions change so that in a measure we unlearn what we have learned before. This is the one peculiar feature of this occupation which differs from any other means of livelihood. It is this that makes our progress so slow, for no one year can determine the value of any new plant or flower. We know that certain laws govern plant growth, but environment and differing climatic conditions put us all at sea again. While for many varieties this has been an ideal year, yet other varieties have suffered. The Harry Kaump, Utter's Red, Walbridge, Janet and Iowa Blush apples scabbed so badly as to be worthless. On the other hand Wolf River, Patten's Greening, Antonovka, Longfield, Duchess, Veronish Rosy and others have been in their element. Our standby Wealthy has been variable, yielding fine specimens in some orchards and making a poor cider apple in others. Small fruit has been of a quality to please the epicure, except in low, flat situations where moisture was excessive, so that the drainage question comes very palpably to the front. This season has demonstrated that the surplus water must be removed if we would secure the best results.

Now, in unity there is strength. Let us get together and pull in unison so that we may accomplish results at this session that will be of value and a credit to this society.

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TUESDAY EVENING SESSION.

An address was given by A. B. Storms, president of the Iowa State College, upon, "Asking God Questions." The address was prefaced by a brief outline of the work done in the various departments of the college, the needs of the college and its hopes for the future.

WEDNESDAY MORNING SESSION.

The president announced the following committees:
On finance and auditing: Messrs. Hatfield, Antisdel and Steigerwalt.
On exhibit: Messrs. Healy, Erwin and Ferris.
On resolutions: Messrs. Fitch, Day and Wayne.

BEES AND FRUIT.

BY A. S. CAULKINS, STORM LAKE.

It has long since become a well-known fact that the blossoms of our most valuable fruits require contact with the life-giving pollen, often from other blossoms, in order to bring forth a perfect fruit. As some fruit blossoms are entirely devoid of this life-giving pollen, nature had to provide a means by which it might be transported.

Nature's plan of propagation by seeds, runners or tips would naturally gather plants en masse and the warm spring breezes could easily pollinate blossoms near at hand if winds and weather were favorable. But they are elements which at that season of the year are not safe to depend upon. Right here Mr. Bee turns horticulturist. When anthers are bursting, brood rearing is in progress and as pollen and honey are necessary to brood rearing the bees are very busy visiting the pollen-bearing blossoms for pollen and pistillate blossoms for honey, thereby disseminating the fertilizing properties. Should the weather be cold and rainy, the bees will be driven to their hives, but they resume operations and are busily engaged long before blossoms are dry enough for the winds to carry the pollen.

We have no means of computing the value of the work done by the bees in pollination of fruits, but with proper handling they will more than pay for themselves in quantity of surplus honey stored. If it was convenient to do so, I think it more profitable, before launching out in the bee business, or in any horticultural line, to serve a short apprenticeship; as we learn to do the work more readily and intelligently by seeing it properly performed; but that is out of the question with most of us, so we procure the best reading matter we can on the subject, roll up our sleeves and get experience.

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By all means use a hive of regular size. I purchase Hoffman frames in the flat and make the balance of the hives. A board ten inches wide makes the body and fourteen inches wide the bottom and cover. Make ends of body twelve inches long and sides nineteen and one-half inches long. With a rabbet plane cut a groove on the upper inside edge of the ends for the frames to rest in. I use flat covers so I settle the frames low enough to give a bee space above them of about three-eighths of an inch. I want the hives to face the south or east and near where I want the bees to work on fruit blossoms, and they should be protected from strong winds and shaded from the sun. I am working for comb honey, so I put on a super with sections in which I have placed a starter of foundation soon after the bees begin to bring in honey. I use strawberry box stuff for separators between sections. I carry over unfinished sections and give them to the bees early in the spring to start them to brood rearing. Bees require but little attention during the busiest season with fruit. Extra hives should be kept in readiness and each swarm given plenty of storage room. Should a swarm become cramped for room it will prepare to swarm. When the honey flow is over the supers should be removed and covers arranged for winter. I loosen my supers from the hive and place a bee escape between them and in a few hours the supers will be quite free from bees. I seldom use smoke unless a swarm seems unusually vicious.

But the wintering seems to be the greatest problem in this latitude. Bees will stand a low temperature if kept dry, but if kept dry and above 30 degrees they will consume less honey and be in better shape in the spring. If land was sufficiently rolling I would have a cave for their winter quarters where they might be kept quiet, dark and warm. My bees seem to be busiest when raspberries are in bloom. The whole raspberry field is alive with bees and the quality of honey is nearly equal to white clover.

Taking it all in all the bee industry is profitable, pleasant and fascinating. Of course, we have our ups and downs, our good years and poor years, and we will sometimes be attacked by an exceptionally cross colony that will proceed to set down upon us with a vim provided they are able to find some unprotected parts; but by studying the characteristics of the little workers, we are surprised at the ease with which they can be handled.

MR. HATFIELD: How shall we winter bees?

MR. CAULKINS: That is an unsolved problem with us. This winter I have mine in a very warm building with the hives well packed in dry leaves and am trying to keep a temperature as near 35 degrees as possible. The greatest danger is in change of temperature.

MR. HATFIELD: Absorbing the moisture is very important in wintering bees.

MR. KINNE: What's the matter of wintering bees in a cellar if dry?

MR. CAULKINS: I think it is all right.

MR. FELTER: I have wintered bees in the cellar for several years and with success.

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MR. KINNE: What about moisture?

MR. FELTER: I make a frame out of inch-square strips and slip it under the hive. In pleasant weather, I let the bees exercise.

MR. DAY: I used to cover with hay or straw and allow the bees to come out, but of a warm day in March they would go out and fail to get back. I think they ought not to be allowed to get out at all; a sudden change in the weather may come and they will be unable to get back. Many bee-keepers in our (Monona) county dig cellars in the bluffs. A cellar detached from the house is best because of the moisture.

GRAPE GROWING.

BY J. S. GRIFFIN, SAC CITY.

We learn from sacred history that the culture of the vine began in a very early period and in many countries has been a very important industry from that time to the present. That it is a very nutritious and health-giving food there does not seem to be any doubt. The fact that many people do every year visit the grape-growing districts of southern France and Italy for the benefit they receive from eating the fruit in its season would help to substantiate this theory.

What we are interested in is, can this fruit be profitably grown in northwestern Iowa? Now, if that means to raise for the market as a money-maker, we shall be obliged to admit we do not know; but if it means for an abundant supply for house use, we say most emphatically, yes. I believe there are many locations along streams where they could be profitably grown for market; but experience has taught me that it is a waste of time and money to plant grapes on the open prairie without protection from the wind.

The writer's vineyard consists of three rows of vines about sixteen rods long, running north and south and on the east side of a row of Scotch pines, so the most of them are well protected from the wind, and I find the better they are protected the better they produce, and I have not had a fruit failure in the last six years. But some vines planted at the same time in an exposed position have long since died. I give winter protection by pruning in the fall and taking from the trellis and laying on the ground and covering with litter of some kind. I renew by letting a shoot grow from the root occasionally to take the place of the old vine when it gets too large and scraggy to handle. If I were going to plant an ideal vineyard, I would select a hillside, southeast slope preferred. I would prepare the ground by having ditches dug parallel with the hill on a water-level, and fill with manure or litter of some kind to catch and hold all the water that falls on the ground. I would plant the vines on the lower side of these ditches and give the same care as mentioned above, and I would have a good wind-break on

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the south and west, and I think there would be no trouble in raising an abundance of this most healthful and delicious fruit.

MR. STEIGERWALT: I do not see why we should discuss the question whether we can grow grapes for our own use. I was greatly and pleasantly surprised to see the display of grapes at the last Minnesota state fair. Certainly we ought not to hesitate to plant grapes for home use.

MR. WAYNE: I have visited Mr. Griffin's little vineyard and can verify all he has said and more too. He sold fifty dollars worth from it this year besides what the home used.

MR. FERRIS: I have a patch of grapes about the size of Mr. Griffins'; it has been planted about twenty years. It clearly proves that grape growing can be successfully followed. The varieties are Concord, Worden and Moore's Early. The location is no better than the ordinary one; no protection except by a few scattered evergreens. The varieties I have mentioned are hardy enough for any ordinary location. My vines did not suffer from root injury a few winters ago.

MR. GREENE: I have had experience with thirty-five varieties of grapes; it is one of the easiest fruits to grow. The grape enjoys a dry, warm situation. We give clean culture, cover tender varieties with soil; hardy varieties do not need cover in Scott county. Cover with soil first and then put on litter to prevent freezing and thawing. If this has been done, probably most of vines would have gone through the destructive winters of '98 and '99. As to the water supply I think this is not important; wet soil is objectionable, bluff land is better.

MR. WRAGG: All our grapes went out in '98 because of clean culture; neighbors' vines that had been neglected went through all right; but that sort of thing does not pay as a general thing. Earth is the best cover. Grape culture can be carried on successfully, especially on the loess soil of the Missouri slope. Certainly every farmer should grow grapes for home use, but we should stick to the hardy sorts, such as Concord, Worden, etc. Plants are often uncovered too early in the spring. Low temperature may follow and injure the vines.

MR. HEALY: In covering roses I have used earth with best success. I peg the bush down and then cover. It is a difficult matter to tell just when to uncover, but for the last half dozen years I have been fortunate in this respect. I take off the cover a little at a time and have some litter near by to put on in case of a sudden change in temperature. If the cover is left on too

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long the buds start and then when the cover is removed they dry up.

MR. ERWIN: If the cover is left on until late in the spring it should be removed on a cloudy day; if taken off on a hot, sunny day the new wood is likely to be killed.

MR. FERRIS: About trellising grapes. One of my vines got away and ran up a tree, it bears abundantly. I then raised my trellis to eight feet; I get more fruit in this way.

MR. WRAGG: I think the trellis should not be over six feet high.

PEARS IN THE NORTHWEST.

BY C. K. PALMULDER, GRANT CITY.

Somehow the expression "northwest" is so closely associated in our minds with cold weather in winter that when we speak of growing fruit in the territory so called because of its location, we instinctively realize the need of strong constitutions, and adaptability to short growing seasons, in the variety of trees to be planted there for that purpose.

In pear growing in the northwest it is therefore essential, first, that we select trees for planting that have "life abundantly." And, inasmuch as abundance of life in the animal and vegetable kingdoms is found only where there is the most perfect organism, it follows that we should select trees with as perfect organism, both as to body, root, and branch, as it is possible for us to obtain.

Secondly: When we, however, launch a tree, be it ever so perfect or great in life capacity, upon a territory where more than ordinary friction is brought to bear upon it by extreme cold weather, sudden changes in temperature, etc., it stands to reason that the husbandman should bestow greater care upon it than he would need to bestow upon the same tree planted in a climate more nearly adapted to its needs. The tree being mortal, must maintain that life by fortifying itself against the friction brought to bear upon it. From the beginning its life means a struggle between power and resistance. Hence, the greater the resistance, the more power and attention required. And while there is more or less friction in all parts of this earth, it is true that certain friction is greater in some parts than in others. Thus while our brethern in southern climes are kept busy fighting scales and insects, the greatest friction we have to contend with in the northwest is cold weather.

After securing proper trees to plant, the next thing necessary is to select a proper location in which to plant them. They should never be planted where water will stand, for, as one has said, "the tree can not stand where its feet will be constantly wet without catching its death of cold." Plant, however, where, if the ground is kept loose enough to readily soak in rain, their feet will be often washed by the spring and summer showers.

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To keep the tree from starting too early in spring, plant on a slope and location which will be the last to respond to the warm winds and sun's action. The north side of a grove or shelter of some kind is admirably suitable for this, and such shelter will at the same time protect the trees from hot winds in summer, which often directly injure them, or force a too vigorous or protracted growing effort on their part; exhausting their vitality, and inducing the invasion of blight and other fungous and germ diseases through the unduly dilated pores. In order that the trees may not become exhausted by too long continued exertion it becomes necessary to shorten their period of exercise, and lengthen their period of rest by artificial means. By the same means also encourage vigorous growth during the most favorable part of the annual growing season, and labor to protect the tree as much as possible, the year round, from injurious elements and conditions; but above all strive to lengthen its periods of repose.

As the bear stores up fat in summer to live on during its winter's sleep, so must the tree store up energy from oxygen and sunlight to sustain it through the trying winter seaeon, and unless it has sufficient reserve force to vigorously rally from the shock when the animating forces of spring return, it will bear but little fruit the following summer, or if it does it will but be to its own destruction. Therefore I say again, encourage vigorous growth during the most favorable part of the growing season, which, no doubt, is during the months of May and June. But because the tree has not the sagacity of the traditional ground hog to retire at the sight of its own shadow if out too early in spring, we must come to its assistance with every possible means to prevent it from beginning too soon. Growth can be induced by cultivation, mulching, fertilizing, etc. Efforts should be put forth as early as the beginning of July to bring the pear trees' growing effort to a close. Some of the means for accomplishing this are the removing of mulch and rubbish from around the trees, the sowing of cover crops, crown pruning, etc.

Some varieties of trees naturally grow for a much shorter period during the year than do others, and, it would seem that these would be the most desirable to plant in latitudes where short summers are the rule. Several varieties of evergreens for instance grow only for a few weeks during the year and are so hardy that they endure without evident injury the severest winters of the Northwest. In pear trees we have some varieties that shed their foliage from three to four weeks earlier than others.

I would advise that at least two varieties of pears be planted intermingled in a pear orchard, as by cross fertilization we do not only get more fruit but larger, and, you know, the best crop to grow in a pear orchard is the pear.

MR. FITCH: Mr. Pelmulder has at Grant City trees well laden with beautiful pears each season; I believe they will do well in favored localities.

MR. CLEMONS: Does anyone know of any variety of pear that will do well on our prairies?

MR. FERRIS: My experience does not warrant my advising pear culture; blight is the trouble.

MR. FITCH: We must bear in mind that Mr. Pelmulder's pears are grown in timber and clay soil along the 'Coon River

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bluffs. There is very little of this kind of soil throughout the northwest. The varieties I have tried on the prairie have blighted and I have destroyed the trees.

WEDNESDAY AFTERNOON SESSION.

AMONG THE WINTER FLOWERS.

BY MRS. JESSE WILKINSON, ALTA.

The window garden in winter almost wholly represents the floral world to those in small towns devoid of conservatory or greenhouse. If there is one thing more than another we appreciate it is the bright cheering blossoms and green foliage when winter has painted the landscape with a dull monotone and everything out of doors is cold and dreary. Yet with a little care and forethought one may convert the most ordinary window into a bower of summery beauty.

The cultivation of house plants is an education, a recreation, and an industry in one and the result is refreshing and well repays the time and labor spent.

To make it a success, it is necessary to enter into the work with the same energy and enthusiasm that insure success along other lines. I am aware that the amateur florist is always enthusiastic and ambitious and very often attempts to grow plants that are hard to care for in a greenhouse. It is better to be satisfied to begin with some of the kinds which can be more easily grown well, to grow into the knowledge of plant growing by easy stages, to familiarize himself with plants and their requirements before he undertakes such difficult tasks. Knowledge of plant life and familiarity with the needs of different varieties with never tiring vigilance has much more to do with the successful culture of flowers than luck. Winter is a trying time for plant growing. The lack of fresh air and sunshine, the sudden variations and extremes of temperature, with coal gas and dust are not conducive to the best development of plants. Still there exist abundant varieties that rise superior to all these disadvantages producing their beautiful foliage and exquisite flowers throughout the entire winter.

The well-known geraniums are veterans in this line and one of the most easily grown. There is hardly another plant which adapts itself so readily to conditions often adverse. There are so many good varieties both single and double that are easy of culture and good bloomers that one can have a nice collection varied in color. They root very readily from cuttings. I keep all young plants for winter blooming. They bloom well and do not take up so much room. I take off cuttings soon after bedding the geraniums in the spring; that is usually about the 10th of May, and set them in by the side of the old plants. Choose matured, woody branches, rather than soft quickly grown ones. I know a great many wait until August to start cuttings of geraniums but I have tried both ways and find that I have nicer young plants to take in in the fall by starting them early. Everything

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seems to be ready to grow at that time of the year and I very seldom lose a cutting set out in that way. When they are well rooted and have a few new leaves, I pot them in quite a rich soil composed of good rich garden soil, some leaf mold and sand and pulverized charcoal. I do not use as much leaf mold in this soil as I do for begonias, ferns, etc. The leaf mold is easily procured from some old grove where the leaves have been allowed to remain until rotted. Be sure to have a good drainage for plants. I put about an inch of coarse gravel in the bottom of each pot and do not use flower pots that are too large.

I then keep them on a box under a tree where they will be sheltered from heavy rains and too hot sun. Do not neglect to pinch back the small plants as they begin to grow. They will need cutting or pinching back several times. This causes new branches to start making them bushy and furnishing plenty of new branches for buds to form on. The old saying "as the twig is bent the tree inclines" applies very strongly to the training of plants in their early stages of development.

The first part of October I repot them, disturbing them as little as possible and bring them into the house. Then you cannot give them too much sun although they do very well in an east window. The above is also a good way to start cuttings of fuchsias, heliotropes, petunias, etc.

Most reliable and desirable are the flowering begonias adding to their beautiful foliage a constant supply of flowers. The well known Rubra is standard for winter flowers. Its immense panicles of coral red render it very striking and it is easily grown. The Vernon is also a good plant for winter. An east window just suits begonias and they will do well in a south window if plenty of moisture is provided in the atmosphere. Begonias rerequire a loose rich soil, plenty of leaf mold and sand.

The heliotrope is not such a showy flower but is very dainty and is liked on account of its delightful fragrance. I have one, the flower of which is a delicate lavender as near white as I have seen any, which is a splendid winter bloomer. The one I have in bloom now is over a year old and has been resting during the summer. They must have a rich soil, plenty of sunshine, the best of drainage and a good deal of water. Too little water will cause them to shed their foliage. They should never be allowed to wilt for want of water. For a winter blooming fuchsia, the Speciosa is a good variety and usually a free bloomer. One should also try to have one or two primroses I think. They can best be procured from a greenhouse in the fall. The Pelargonium, commonly called Lady Washington or Pansy Geranium is very beautiful in its blooming season, which in well grown plants is usually a period of three or four months. They usually begin to bloom in January or February. I have tried several kinds but find the old single rose and white the most profuse bloomer. One-year-old plants and upward are most prolific and a period of rest is imperative.

After blooming, the plant should be kept in a light, airy place and water withheld until the plant sheds its leaves. Keep it as nearly dormant as possible. In September cut back severely, repot and soon new shoots will start out. I have never used a very rich soil for this plant, only garden soil and a little sand. Keep it in a cool place. Heat is a great enemy of this plant. Too much heat encourages a weak growth and quite often prevents it from

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flowering. After the plant buds it will need the application of a fertilizer about once in two weeks also during the blooming period.

Carnations are beautiful flowering plants but I cannot tell very much about them from my own experience. Last spring a friend of mine gave me a number of seedlings about three inches high which I set out in the flower garden. This fall they were all budded I raised them carefully and potted them and they did very well. I have had a nice bouquet of carnations from them.

If one wants a rose for winter blooming they will find the Clothilde Soupert a fine rose and one that almost everyone can raise successfully. It requires good soil, but no leaf mold, frequent showers and a sunny window.

It is nice to have a few bulbs, especially hyacinths and a pot of freesias. The bulbs require very little care and when through blooming can be set out of the way.

The chrysanthemum is the most popular flower of the autumn and it well deserves this popularity as we have no other hardy flower that equals it for display.

The decorative qualities of the chrysanthemum render it suitable for all purposes and a favorite with all lovers of flowers. The advance which has been achieved by florists in the culture and improvement of this beautiful flower for exhibition purposes in recent years is remarkable. I will not attempt to tell anything of its requirments, as the result of my efforts would not compare very favorably with those shown here.

Do not overwater plants at this time of the year. Many are making slow growth and will require little water. Do not make the mistake of going to the window and watering every plant there, as different conditions of plants make a difference in the amount of water they take up.

Too much stress cannot be laid on the importance of proper drainage. Stagnant water will soon sour any soil, and a sour soil means diseased plants. Stir the soil in the pots frequently. This allows the air to penetrate it readily, greatly to the benefit of the plant. Turn the plants in the window occasionally It makes them more shapely and in no way interferes with their flowering. The dryness of the air is one of the chief drawbacks to successful plant culture, and one must try to counteract it. Shower the plants often and it is a good plan to keep a vessel of water evaporating on the stove. Plants need fresh air the same as human beings, so be sure to admit fresh air daily but do not have it come directly on the plants, as in cold weather they would be chilled

You must keep your plants free from insects if you would have them do well. It is much easier to keep insects from establishing themselves on them than it is to get rid of them when they are once established. Try to never allow any of these enemies to gain a foothold among your plants.

Even if you have but an ordinary window and but little spare time, try to have a few flowering plants in winter.

They gild the dark months of the year with bright color and bring sunshine and cheerfulness to the home.

MR. WAYNE: How do you prevent insects on plants?

MRS. WILKINSON: I have used Pears' soap; showering the plants with insect powder I find excellent.

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MR. GREENE: Tobacco water is used for killing green flies. The red spider is very destructive to plants growing in a dry atmosphere; this is the chief reason we do not succeed with fuchsias, sweet peas, etc., during the hot months. Spraying the plants with water is the remedy; give plenty of moisture and there will be no trouble. The mealy bug is perhaps the next most troublesome insect. The scale also infests many greenhouse plants; whale oil soap is used to kill these.

MR. KINNE: How do you prepare tobacco water, what strength?

MR. GREENE: The usual formula is one pound of stems to five gallons of water. Go to a cigar factory and get stems, or use cheap smoking tobacco, put in a bucket of water and let it soak over night. It is the nicotine that you want. The scale is easily destroyed when young; then they move about. After they are located the scale is secreted and they cease to move about. This is usually in May or June in this climate on plants in the garden; in the greenhouse much earlier. In the eastern part of the State we are troubled with the plant lice on our snowballs; they work on the leaf which curls up and injures the plant. This can be avoided by treating the plants with tobacco water early in the spring before the insect gets sufficiently numerous to cause the leaf to curl; begin the treatment early.

FLOWERS AND FRUIT IN THE HOME.

BY MRS. WILLIAM W. WILLFONG, ALTA.

In flowers and fruit we have two things that go far toward making a home attractive and happy. In the flowers we have something that is pleasing to the eye, and gives life and glow to the home. Increasing taste for cultivation of them is evidence not only of progress in refinement and material wealth, but also of appreciation of the beautiful in nature, and the goodly influences brought to bear in an education to a higher human nature.

While the well-to-do family may have costly and elegant plants in the conservatory, even the poor may cultivate a taste for flowers and enjoy their fragrance as well. The most humble home well kept, with a few flowers to grace its interior, is beautiful. How beautiful and yet how cheap are flowers. The poorest little flower that grows has some uplifting influence in it. A man or woman who does not like flowers is to be pitied, for there is certainly something lacking in his or her makeup. It is one of God's most beautiful ways of speaking to us. What looks prettier than to pass a house with bright scarlet geraniums nodding to you through its window? What

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is more appreciated by the invalid? Carry them to some sick person some time and see. Watch their face light up as though you had let in a bright ray of sunshine. A flower in the window sweetens the air, makes the room look more cheerful, and is a companion that will never say a cross word. There is a class of persons among the many who cultivate flowers who make the mistake of grudging the cutting of them. Friends do not do this. In the very first place it is not right. It is contrary to their very nature, and must I say it? I fear it is selfish, and I know you do not want to be selfish. Do not raise flowers merely for your own use and just to look at, but *use* them, *cut* them, and give to those less fortunate than yourselves, and in giving you give happiness and pleasure to others. God gives them to us and He is not at all selfish in His giving. Why should we withhold these free God-given pleasures? The natural tendency of nearly all plants is to throw forth blossoms to produce seed. In cutting you deprive it of its mission and the result is, more are thrown out, and you are rewarded by more profuse blooming. Then there are some who seem to raise flowers for others. While they enjoy and love their beauty and fragrance just as much, yet they take extra pleasure in sharing it with others. These people always seem to be successful in flower culture, the reason I think must be as a prominent florist of England has put it. "To grow flowers successfully you must grow them in your heart." Yes, by all means have flowers. If you cannot have many a few is better than none. Do not think you must have a great mass of them to make a bouquet; a few tastefully arranged is far more beautiful and graceful than a great bunch crowded together. Do not despise them because they are cheap, and because every one may have the luxury as well as yourself. Common things are cheap, but common things are invariably the most valuable. If we were obliged to purchase sunshine or fresh air, how highly we would value them, but they are free to all and how little we think of their blessings.

In the fruit we have nature's best doctor. Fruit if plentifully and intelligently used will go far toward keeping the body and mind healthy. Fruit is not only pleasing to look at, but appeals also to the taste and smell. Nearly every housewife considers it a valuable addition to her table, but few stop to consider or perhaps do not know the health-giving qualities contained within. It lies within the power of nearly every family who own their own home, excepting those in the cities and larger towns, to have a plentiful supply of fresh fruit, but how few, comparatively speaking, avail themselves of the privilege. With proper management one may be able to supply their table with fresh fruit from early spring until late fall. First, early in the spring comes the rhubarb; now some may sniff their noses at this common old-fashioned pieplant, but much can be said in its favor. Coming as it does so early it supplies the long-felt want for our sluggish bodies. Then comes the luscious strawberry, liked by all, and it is said it is both food and medicine. Then comes the cherry, raspberry, currant, blackberry, apple, plum, grape, etc., each furnishing their share toward giving us good blood, which in its turn gives us good brain and muscle. The medicinal powers of the grape are especially spoken of. While our apple, our most common fruit, is a close follower. An eminent doctor has said that "apples are excellent brain food, because they contain more phosphoric acid in easily digested shape than any other vegetable known." It

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excites the action of the liver, promotes sound and healthy sleep, and thoroughly disinfects the mouth. It agglutinates the surplus acids of the stomach, helps the kidney secretions and prevents calculous growths, while it is one of the best preventives known of diseases of the throat. It seems strange that more people do not realize this, but many consider fruit a luxury instead of a necessity to our health and well-being. Of course people who are obliged to buy all their fruit may not be able to have so much of it, but a great many things that appear on our tables might easily and profitably be exchanged for fruit, and, too, some think if they have fruit it must be mixed up with a lot of "stuff" before it is ready for the table. Use your fresh fruit as it is; do not think you must rub butter into flour and put your fruit between to make it palatable. What is nicer than a big dish of fresh fruit with a generous supply of sugar, and good bread and butter sandwiches? Yes, by all means use your fresh fruit as it is in the summer, and save your fancy pastry until winter if you must have it. I would say to all, cultivate more fruit, do not begrudge the time, labor and money spent in that way, for you will be repaid a hundredfold. And do not forget to bring all the bright things into use. Make your homes as beautiful as possible. There is much in nature that we do not half enjoy. We want more loving knowledge to enable us to enjoy life, and we need to cultivate the art of making the most of common means and appliances of enjoyment which lie about us on every hand.

"Oh, make your homes happy with cheerful delight,
And children, like chickens, will come home at night.
And none of your household will willfully roam,
But ever remember, there's no place like home."

THE PRESIDENT: As the next paper is on a related topic and we are pressed for time, we will combine the discussion. We will now listen to a paper on "The Farmers' Flower Garden."

THE FARMERS' FLOWER GARDEN.

BY J. S. BENNETT, STORM LAKE.

We live in an age of progress. The United States is a land of progress, The old proverb which says that there is no new thing under the sun is true. The material that makes up things has been in existence we know not how long, and the laws which govern things have existed since they were ordained by the Creator and set in operation. Matter may change its form, and laws may change their relation to each other, but the same material and the same laws exist. It is no new thing for flowers to be cultivated. The Egyptians placed flowers on their tombs and so made the most enduring record of floral culture. The Babylonians produced gardens that were the wonder of the world. The wisest man that ever lived spoke of vegetation from the cedars that grew in Lebanon, even to the hyssop that sprung from the wall.

The farmer is a man of progress. He has the latest machinery. In a few decades he has advanced from the use of the hand cradle and the flail to the self-binder and steam thresher that will do as much work in a few days

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as would a score of men in a season after the old method. He has advanced to the rural telephone which puts him in instant communication with the busy world at large, and the electric road that puts his products on the early market at par with the city dealer or stops at his door to take him to the centers of population. I might cite many more marks of progress, but I have been warned to be brief.

Along with this progress should we not expect him to transplant the flower garden from the city park to his country seat? The main planting of every home ground should be largely of trees and shrubs. The home maker should have a picture that he endeavors to produce, and to brighten it, he should plant flowers. The kind of flowers to plant is not so important as how and where to plant them. A flower that is otherwise insignificant is made attractive when placed against a background of trees or buildings. The flower beds in front of houses usually lose their effect because of this reason. Small beds is a stingy method of growing flowers. When Nature plants a flower bed, she plants enough of them. A man may be impressed with the beauty of a geranium bed in a city park, while the few sickly geraniums in his own flower bed makes no impression upon him. Plant enough flowers so that you can pick a large bouquet without marring the beauty of the garden. Seeds are cheap. Do not buy novelties; leave them for some one else to prove. As a usual thing, packets of mixed colors are the best, especially of such flowers as sweet peas, nasturtiums, petunias, and asters.

Even if you live on a rented farm, you can have flowers. Many of the most showy flowers are annuals and the expense for seed is not great. Prepare your soil well, and if necessary, spade in some well rotted litter early in the spring. If borders are made in sod, have them at least three feet wide that the grass roots may not run under them, and so rob them of their support. Run a sharp spade around the bed from time to time to cut off the grass roots.

Sow sweet peas early in the spring. It will not injure them if the ground freezes after sowing. Most of the annuals should not be sown until corn planting time.

Having your bed thoroughly prepared, press the ground level with a board, and sow your seed thickly and afterwards thin out the plants to the required distance. If they are to be viewed from all sides, place the tall ones in the center, or if against a background, place the low ones in front. Keep the ground loose by cultivation.

Some of the best screens are made of annual vines. Morning-glory, Cobæa, and Madeira are useful for this.

Plants with bulbs can be grown by the renter very well. They can be kept over winter in a cellar, in a place that is suitable for potatoes or onions. They may be started early in the spring, and so get an early start. Gladioli, dahlias, and cannas are suitable bulbs for this treatment.

The one who owns his own farm can have many more flowers among the hardy shrubs that will not require much labor and be a more permanent part of the garden. The home flower garden is for the enjoyment of the family rather than the passer-by, and affords an opportunity for experiment and study. It should display a large amount of individual taste. You may ask your florist's advice about your garden and then after studying what the

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market and material at hand offers, you can develop your own thoughts and get more pleasure from it than by following fixed rules.

MR. WRAGG: I like that sentiment in Mrs. Willfong's paper, that we must plant flowers in our hearts. We must love flowers not only for the joy we get from them but we must love them because they are expressions of the Divine. We must not lose sight of the old-fashioned flowers which we can grow so well everywhere. I wonder how many lawns in this town and through the country have the snowball, mock orange, acacia, tree and vine honeysuckle. As farmers and townspeople we do not appreciate the possibilities of beautifying our homes with flowers, which are the poetry of our lives. If it were not for the efforts of the women there would be but few flowers. We men think they are not of much importance because "there's no money in it." We shrug our shoulders and call it "sentiment," overlooking the fact that sentiment is the better part of our natures.

MR. WAYNE: In regard to planting flowers for the home rather than the passer-by; I think the latter should be considered who thus feels kindly toward the inmates of the home.

MR. CHAPMAN: One of the most beautiful sights I ever saw was one January morning when loitering about Lake Charles, La., we came to a residence where by the front gate set a large clothes basket full of lovely roses with a placard saying, "Help yourself." There was a schoolhouse near by and troops of children helped themselves to roses as they went to school. We took the liberty to enter the house and found it to be the home of old Iowa people—the Knapp's, formerly of our state college.

A LADY: Is there a civic league near here?

MR. GREENE: There is one at Red Oak. There ought to be one in every town—a society for the betterment of the community. There is no reason why we should not have abundance of flowers about our schoolhouses and thus create a love for the beautiful in the minds of children.

MR. STEIGERWALT: Organization for civic betterment is of the utmost importance; nearly every town has clubs for card playing, etc. How much better to use the energy to the improvement of their community.

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MR. HEALY: In Sioux City an organization was formed about two years ago. It has auxiliaries in different parts of the city and friendly rivalries exist in different residence suburbs as to which shall show greatest improvement in appearance. This year I was a member of a committee on awards, and in going about the city and noting the changes wrought in a single season, I was greatly surprised. The league buys the seeds by the wholesale and gives them to those who feel unable to buy them.

About roses. It is not generally known how easy it is to grow these beautiful flowers. I now have seventy-five varieties; and of the hardy roses there are twenty varieties. I will name them; all hardy, hybrid perpetuals:

Mrs. Robert Peary:
This is said to be the *one white* hardy climbing rose. I have one growing, but those I have planted before I have lost in the winter. I have not, however, given it a fair trial. It is simply an elegant rose, well worth trying. Dr. Miller, of the city, has grown them successfully.

Prairie Queen:
An old reliable rose that every one knows of.

Crimson Rambler:
Very hardy, and one which you are familiar with. There are other ramblers, yellow, white, etc. I have never found them successful in blossoming.

Climbing Wooton:
This rose is recommended very highly. It is a little hard to get started, but after the first year grows very strong, and has a very beautiful pink blossom. I have a very fine plant.

Empress of China:
Climbing rose. Grows very rapidly. Not *very* hardy. Needs a great deal of care in the winter time.

Baltimore Belle:
A climbing rose of blush color. Said to be not hardy in this latitude. I have a beautiful plant, however, that has been growing five or six years, blossoms very freely and is a grand plant. I think it is worth while to try it.

These are all the climbing roses I have had success with:

American Beauty.

Anna Diesbach:
Splendid carmine rose. Hardy and beautiful.

Coquette des Alps:
A lovely white rose with a little blush center. It is very hardy and a very free and strong grower, and blossoms all the season freely. It is simply a *splendid rose*.

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John Hopper:

Rosy pink, very large and full. One of the *very best* roses. Grows strong stout stems and blossoms profusely.

Dinsmore:

Crimson scarlet. Hardy. Very large double blossoms. Needs to be *thinned* as to buds. It buds so fully that frequently they do not have strength to blossom out.

General Jacqueminot:

One of the very best of them all, but you know about it.

La Reine:

Pretty pink rose. A very graceful, pretty rose tree and lovely blossoms. It is a hardy reliable rose. You ought to have some of them.

Madame Plantier:

Pretty white. *Exceedingly hardy*. Blossoms very freely.

Magna Charta:

A *splendid rose*. Rosy red with large blossoms.

Margaret Dickson:

A pretty white rose, very highly recommended. I have one, but have not had it sufficiently long to say how hardy or valuable the rose may be.

Paul Neyron:

Has the largest blossoms of any rose known. It is all right in every respect.

Mrs. John Lang:

Pretty shaded pink. A lovely rose, very hardy, one of the old reliables.

Prince Camille de Rohan:

It is known as the "black rose." It is a red, velvety crimson, shaded black. I have only one bush and it is not growing strong, but it has been with me five or six years and I think it all right.

Ulrich Bruner:

Very like the Jack rose. A very hardy, strong grower, I think the *very finest rose* in my garden. No thorns!

Victor Verdier:

Rosy crimson. A good, reliable, hardy rose, and a beaufiful blossom.

Peony:

A profuse bloomer. The buds need to be thinned somewhat. It is hardy. The roses individually are not so pretty as some; but the effect of the rose tree in full bloom is fine.

Marshall P. Wilder:

Crimson shaded with maroon. Very large and double and certainly a magnificent rose.

I have planted very few other than hardy hybrid perpetual roses. One rose, a hybrid tea, called Belle Siebrecht, is a deep pink and a beautiful rose. I think it is the most beautiful rose I ever saw. It is said to be hardy with good protection. I have never been able to keep it over winter, however. Perhaps you can do better than I. This rose has long pointed buds that are simply beauties. A pink LaFrance is another rose of like kind.

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MR. GREENE: How do you protect in the winter?

MR. HEALY: Lay the bush down before it freezes, say in October, and peg with stakes. When green they are flexible and will bend easily. Just before the ground freezes, cover with earth. Keep them dry; dry earth should be used. I rarely lose a rosebush. Cut back fairly well in the spring. Do not prune through the summer, except the flowers and many buds with them.

MR. WRAGG: I am glad Sioux City has an improvement league. There is one near my home, at Perry. The women, of course, started it. The tin cans had to go to the cinder piles. The spirit became contagious. The business men got together and offered prizes for the best-kept lawns, for the best flower beds by girls under fifteen, and the best row of trees along the streets by the boys.

MR. HATFIELD: A number of years ago my wife started making a flower garden. After she had worked at it for some time I realized the beauty of it, and now I am a flower enthusiast too. The children from the school near by flock to it; two years ago the teacher asked for some plants and now the children have become greatly interested in their excellent flower garden.

HOUSE PLANTS.

MRS. C. P. CORNELINSSEN, ALTA.

A well-kept window garden is a source of great pleasure to the lover of flowers. Nothing adds more to the comfort and beauty of a home than thrifty plants blooming in the window. It ought, however, to be well kept, for a lot of sickly plants covered with vermin is an eye-sore to the owner and brings feelings of regret rather than of joy or pleasure. I am not one of those who are favored with plenty of sunny windows for plants, but I cannot live entirely without them, and winter finds me with quite a supply. It is true, plants require much care. A plant is not likely to be killed with attention if its nature and habits are understood, and its wants supplied intelligently. Doubtless many plants are killed by improper treatment, such as overwatering or overdosing with insecticides, or they may share the same fate by neglect.

It is not practicable to lay down a rule that all the plants should be given water at the same time, each single specimen must have its own particular wants attended to, so much depending upon the situation and the general temperature of the apartment in which it is growing. The golden rule in

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watering is, give water only when the plants need it, but then water thoroughly. A good way to water plants that require a great deal of moisture, is the placing of the plants in tubs or pans with a quantity of water sufficient to mount up to within an inch of the rim of the pot, allowing the plant to stand there some time, so that the water can soak through the pot and rise up through the ball of the roots and earth, thus making sure that a thorough soaking is given. A palm or fern, for instance, if once allowed to become dry at the roots, will never recover its pristine vigor, and there lies the whole secret of their successful culture. All plants which are grown for their foliage effect and which are therefore to be kept for any considerable time in the house must receive attention at the tops as well as at the roots. In the cleanest of houses dust will accumulate, and this settling upon the leaves, blocks up the breathing pores of the plant, the only remedy is the removal of the dust, to which end a sponging of clean water at least once a week should be given. House plants call for skill and judgment and a careful study of what each plant requires to make it grow healthy and strong. We often find it a difficult matter to select plants from catalogues. Every plant mentioned is described so attractively that it seems as if our window garden must be sadly incomplete without it. But do not let enthusiasm get the better of your good judgment. Make up your mind to have only as many plants as you have room for, and having done this select such kinds as will adapt themselves most readily and most fully to the care you can give them.

The culture of pot plants from seed is becoming more popular every year and the practice is recommended as it is not only economical, but a source of interest and pleasure to the grower. There is a peculiar charm about the plants we raise from tiny seedlings until they develop into full grown, blooming specimens. Sowing the seeds, watching for the appearance of their delicate leaves and the growth of new foliage and branches until we are greeted by the buds and flowers and interesting seed pod—all are progressive stages in the life of our flowering plants that bring pleasure in their care and attention. As a rule we appreciate most things that cost us the most, either in money or labor, and there is no exception to this rule in floriculture, as perhaps every floral enthusiast who has raised plants from seed, or from cuttings will readily attest. Among the most graceful and beautiful of foliage plants are ferns, for a shady window, or hall decoration, the ferns will be found very desirable plants. They like a cooler atmosphere than most plants grown from the window. When ferns are once established in pots do not repot them more than once a year, and that invariably when the plants are in a dormant state, they should never be disturbed while growing. It is a mistake to use very large pots for ferns. The scale insect is the worst foe and difficult to dislodge. That geraniums are as common as air and light, but like air and light they are welcome, giving us blossoms all the year. There are so many excellent plants to choose from, but the amateur who has only the ordinary window to grow them in, from experience I have had, think best not to experiment with novelties. Get those whose merits you know something about. Have some of the good old stand-bys.

What shall be done with the house plants during the summer? Some persons turn their plants out of pots, and put them in the open ground,

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then in potting the plants in the fall, a great share of the roots made during the season must be cut away in order to reduce the soil containing the plant to the size of the pot it must go into, so that it is impossible to avoid giving the plant a severe check at the very time when it ought to be the strongest and most vigorous, and in this way most of the strong growth of the season is disposed of. So you have, when you take the plant into the house, a sort of skeleton plant, and no larger than it was when it was put out, and it is far from being as strong and healthy. I believe in keeping all plants that are intended for winter use in pots the year around. I would put them on a sheltered veranda opening to the south or east, if I had one, if not, would give them the best place I had, sheltered from strong winds and sunlight. Cut back those you care to keep for another season's use in the house; some of them need repotting; none of them should be allowed to bloom during the summer. I think it is a good rule to blame ourselves if flowers do not grow and bloom, in not studying the right way to treat them.

NOTES ON FLORICULTURE.

BY WESLEY GREENE, DAVENPORT.

When your secretary suggested that I write something about "posies" he came so near one of my "hobbies" that I was easily beguiled by his entreaties to tell you how little I really know of the subject.

The old word "posy" is a little obscure as to when or how it originated, but it seems to have come about in this way: Ye Ancients had a custom of giving gifts to their friends and with the gift was sent a little billet expressing poetic sentiments of friendship. Flowers were often sent as tokens of kindly remembrance, and I suspect that many an ancient Romeo, on occasions like this, has felt his utter inability to express in words the passion burning within him for his Juliet, and being unacquainted with a Muse who could put into appropriate language his emotions, sent his bunch of flowers without a billet, trusting that she could read in unwritten lines more than he with trembling hands and throbbing heart could indite; and from the frequent repetition of these conditions the poetic sentiments were merged in the gift, and we have "posies" as the concrete representative of both poetry and flowers. You know there is a great deal of poetry and sentiment in that old word. Coleridge says, "Poetry is the blossom and fragrance of all human knowledge, human thoughts, human passions, emotions, language." But I am not going to indulge in sentiment, or invoke the Muse to give expression to what I have to say, but will endeavor in very simple language to give you the methods employed in growing flowers and plenty of them. I hope you will concede, without argument, that flowers and their cultivation are worthy of our careful consideration, and that the æsthetic effects are as great as have been ascribed to them. It has been written that "no man, however innocent and well-grounded in virtue, could live among ash heaps in the miserable areas of the slums without suffering a moral change. If any man doubts this let him analyze his thoughts some hour when his only landscape is a pile of cinders, old rubbish and brickbats. It makes

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him feel vicious. The man who lives in such environments, if not a criminal, will speedily be one." This may be an over-statement of the other extreme, but if such is, in part, the effect of unkempt surroundings, and many a landscape is defiled by these waste products of modern civilization, it behooves us to give some attention to the cultivation of those things which tend to increase the virtues of good citizenship, ennoble mankind and create a love for domestic life. I think, sometimes, that we are a little too parsimonious in the allotment of space about our dwellings for decorative purposes. We should get away from the old idea of the paddock in which the wandering tribes confined their herds, as the proper place for a garden. It is probably true that in the evolution of the race the idea of a garden, as well as the practice of gardening, was evolved from the cultivation of plants in these small enclosures; the richness and fertility of the soil found in them and the encircling walls prevented incursions from grazing animals, all of which, in those primitive days, forced the selection of such a place, but we want the garden outside the fence and the house in the garden. The only thing now which needs confinement is the domestic animal or the man who does not respect property rights.

With ample space—let us say a quarter or half acre—located as near the kitchen door as possible, we are ready to begin operations. The ground should be plowed late in the fall after having received a liberal dressing of well-composted manure. That part which is to be planted early in the spring—as soon as the frost is out of the ground—can then easily and quickly be put in condition with a garden rake for planting; but that which is to be planted later should be plowed again in the spring and thoroughly worked until a good seedbed is prepared; then before rain falls on it lay out the bed with a line, garden-rule and a wide shovel. We make the walks thirty inches wide and about two inches deep, finishing the beds which are about four feet wide and any length and shape desired, with the steel rake, using the back of the rake to level up the walks. During heavy rains these slight depressions are sufficient to draw the water from the beds and prevents the soil from running together or baking as it would do were the surface level and the water stood on it for a few minutes.

We seldom sow flower seed in the open ground, preferring to sow in boxes, trays or flats as they are sometimes called. We keep these seedboxes in the greenhouse, hotbed, or in a warm room until the plants are ready to set in the open ground. Let me say right here that I believe a greenhouse to be essential to a well regulated farm and just as necessary as the granary, corn crib or stock barn; it is the winter storehouse or barn for plants. By transplanting we save the first weeding of the beds, which you must do when seeds are sown in the beds. We can transplant the whole garden as quickly as you could do the first weeding. When you transplant the soil can be worked at once and the weeds never get a start on it. The transplanting is usually done from the 1st to the 20th of May.

A plan for the garden is made in the winter. A map is drawn to scale and each plant assigned its proper place so that no delay need occur in the rush of planting in the spring. The making of the plan in the winter is no small part of the pleasures or enjoyment of gardening. We set in these beds greenhouse plants which are hardy enough to endure open ground culture in this climate, all the annuals and tender roots and bulbs

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that were stored in the cellar during winter. This does not include all of our garden, however. The herbaceous border must have attention also. This border should be, as its name implies, along the boundary of the plantation, usually between the shrubbery and the lawn. It may be of any width and should be irregular in outline to relieve any stiffness or formality in arrangement. If you can have a background of evergreens, or of tall shrubs, so much the better. In the border we grow peonies, perennial phlox, lilies, funkas, hemerocallis, hybrid roses, clematis, spiræa astilba and palmata, bleeding heart, columbines, tulips, hyacinths, begonias, hollyhocks, platycodons, perennial poppies, hardy larkspurs, and many other hardy plants. It requires some skill to arrange the border to make it attractive through the growing season, from early spring until late in the fall. If you do not care to have a flower garden separate from the border, you can plant the annuals and other tender plants in it, and thus add very much to the attractiveness of the border. As a matter of convenience in cultivating the plants and for gathering the flowers, commercial florists usually plant in rows, but the amateur in most cases will find the beds are more satisfactory; scarcely enough of any one variety is grown to make a row of any considerable length, and a group of plants is usually more effective, at least from an artistic view-point, than the short row. Yet we use rows, especially where necessary, to blend or unite the flower garden with the vegetable garden.

A row of sweet peas would easily blend the following sorts with the edible varieties. While we plant the vegetable garden adjoining the flowers on account of the convenience in preparing the ground for planting, we do not mix the plants. A vegetable garden, when well tended, is a thing of beauty, sometimes more attractive than the flower garden that is not well taken care of. I do not believe, however, in mixing the vegetables with the flowers any more than orchard and berry plants with the shrubbery and ornamental trees on the lawn. We are willing to admit that a fruit tree in full bloom, or when laden with the luscious fruits, is a beautiful object. We do not get the best fruit from trees growing under such conditions. To get the best fruit we must feed the tree well and give it such care as will produce a good crop, but on the lawn there are other considerations than those of fruit. We do not wish to make a beast of burden of that which was intended to serve us in another capacity. The family with only one room may get along very happily in it as a kitchen, dining-room, library, and sleeping-room, but it is only dire necessity that would sanction such democratic simplicity in the home life. Under more comfortable circumstances we insist on separating the kitchen from the dining-room, the library or studio. The amenities of life seem to require these distinctions. The artisan lays aside the garments of his trade when he mingles in the festivities of conventional society. Good people instinctively separate themselves from those who are bad. The antipathy of the one for the other serves as a dividing line to separate them. We instinctively recognize these differences among men; and there exists similar conditions among plants; an unwritten law which we must study in floriculture as in sociology. Let me give an illustration, for the subject is too large to discuss here: Let us take the carnation and zinnia. What would be the last analysis of your consciousness in regard to these plants? I do not wish to speak disparagingly of

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either of them, for I am a devotee at the shrine of both. The carnation is pleasant to the touch, its fragrance is agreeable, its color has a depth and richness that far surpasses that of the zinnia. You are pleased with it and pin it on your clothing or put it in a vase on the table. The zinnia has good qualities. It is not so pleasant to the touch, nor so fragrant, nor are the colors so rich as those of the carnation. It is not so agreeable to you in close contact with it as the carnation, but when viewed from a distance it looms up grandly and far surpasses the carnation as a decorative plant for the garden. Thus we might go through the whole list of plants studying their peculiar characteristics. It is intimate knowledge of plants which makes cultural directions a very simple matter and easily learned.

WEDNESDAY EVENING SESSION.

This session was given up to an excellent literary and musical entertainment by the people of Alta and vicinity.

THURSDAY MORNING SESSION.

The committee on finances reported:

MR. PRESIDENT—Your committee on finance has examined the treasurer's report, his vouchers, and counted the cash on hand, and find them correct.

W. F. STEIGERWALT,
A. W. HATFIELD,
H. N. ANTISDEL,
Committee.

Report adopted.

The committee on resolutions reported:

Resolved, By the Northwestern Horticultural Society, in convention assembled, at their twelfth annual meeting, that we thank the officers for the efficient way they have discharged their duties, especially the president and secretary.

Resolved, That we thank the people of Alta for their kindness and generosity in helping to make this meeting profitable and interesting by their general hospitality to visitors and by their presence in the daily sessions, and more especially by their Wednesday evening musical and literary entertainment.

Resolved, That we tender our thanks to the Hayes Township Brass Band for furnishing music for the Wednesday afternoon meeting.

H. H. FITCH,
J. WAYNE,
J. B. P. DAY,
Committee.

Report adopted.

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The committee on exhibits reported. The principal awards were:

For best individual exhibit, L. A. Clemons; second, H. L. Felter; best county collection, first to Monona county; second to Buena Vista county; third to Woodbury county; best collection of seedlings to H. N. Antisdel.

The committee presented the following resolution:

Resolved, That the directors appoint a local superintendent, who shall have in charge the awarding, entering and proper labeling of all exhibits.

Second, That the secretary provide exhibit label cards and holders as we believe the labeling of varieties means much as an educational factor to the public, and that a superintendent of exhibits would expedite and insure more accurate work on the part of the judges.

Report and recommendation adopted.

IMPORTANCE OF TEACHING HORTICULTURE TO CHILDREN.

BY H. H. FITCH, LYTTON.

The mother's face and that of the father and other members of the home are the first pictures that attract the child's attention. A little later the home and its surroundings are carefully noticed and their beauty and comfort, or their lack of these and of all things ornamental is also noted.

The beautiful house and the shrubbery, the trees and the orchard and the garden, early make an impression on the mind of the growing child that will be a memory pleasant or otherwise that will always remain with them until life's journey shall end. Ths strawberry, the cherry, the rosy cheeked apples, should always be found on every farm home. These are the materials by which object lessons may be taught to the growing child. These luscious fruits, which children as well as grown people love so well, appeal to the appetite of the child and cause it to inquire from whence they came. Did father, or perchance grandfather, plant these trees that produce the fruit we love so well? These children that are now growing up in the shelter of the homes which we occupy, or that have gone out from the homes of these pioneer settlers of our rich and beautiful prairies, are to be the future homemakers of our country. Surely they should be taught how to grow shrubs and trees, fruit and flowers. How can they be taught? By our example they may profit much. Nearly all who attend these horticultural meetings have studied and thought much upon these subjects. The farm and village homes are the silent but ever present witnesses of how well we have learned our early lessons.

We may not be so absorbed in growing wheat, oats and corn, or fattening cattle and hogs, as to forget all the more bountiful and sweeter things of the home and its surroundings without great loss. Many among us have settled here with a very limited means to make a payment on the farm, make the necessary buildings, and provide for the necessities of the family. To

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such the process of addihg the orchard, and the ornamental trees and shrubbery, that render the home more pleasant, tasteful and inviting, must come more slowly than to those of us who were better prepared. Every bluegrass lawn, every beautiful shade tree and shrub in the dooryard beckons to every man, woman and child that passes by from a home not thus beautiful, to go and do likewise in their own dooryard and about their own home.

Should horticulture become one of the studies of our common schools? Before adding horticulture to the curriculum of our public schools, it will be necessary to have teachers who know something of this science. Very many of our teachers have not as yet given much thought to the grass that grows beneath their feet, and carpets the lawn, the field and roadside, or the flowers that bloom in the meadows or ornament the garden and the home, or the fruit and shade trees near by. The curriculum of our public schools covers a multitude of useful things at present. However, horticulture might be made a study, especially in the spring term when plant and tree are wakening into life from the dormant condition in which they have passed the winter. If the teacher is prepared to explain the science of grafting and budding by means of which we improve the quality of fruit, and make orcharding successful, the pupils can scarcely fail to be interested. Still we must rely upon the instruction of the home, the farmers institute, the agricultural press, and an occasional magazine devoted to horticulture.

As many of our youths as can, should attend the Iowa State College at Ames, where the best methods of agriculture and horticulture are taught. Every student from this institution returning home will bring greater knowledge to the home, and a blessing to the neighborhood where he may reside. He who would become a nurseryman should not fail to take a complete course in horticulture at Ames.

The intelligent man who has been taught in the home and by reading the thoughts and comments of those who are skilled in the science of plant and fruit growing will not readily be duped by the glib-tongued tree peddler who talks learnedly of the great superiority of whole root grafting, or who claims to sell trees imported from Russia and sell them for $1 each, or the wonderful strawberry plant which can be grown in an old barrel in the back yard, and will yield a barrel of large luscious berries annually, price $1 a plant. True, the people who are thus deceived never attend horticultural meetings or farmers institutes, and read but little. They form quite a numerous body of our people who have homes and money. May we not hope that by the better education of the children the number of dupers in the future will be less, and that the number of homes where beautiful shade trees, thrifty orchards and flowers abound, will become the rule all over these prairies.

MR. WRAGG: I heartily endorse the paper. It is sentiment which is ninety per cent of life. Those who know the condition of school grounds as well as the average home know the necessity of creating a sentiment for better things. The State Superintendent of Schools has a bulletin in preparation urging the teachers to try to awaken an interest in embellishing the school grounds. County superintendents should come to these meetings and get enthusiasm and carry it to their teachers.

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MR. GREENE: The new education is applied to the perceptive faculties instead of the memory. The kindergarten system is along this line. Nature study is the basis of it. We are going to teach the things that concern us, the everyday things. It is said our curriculum is already overloaded; this is because we have not dropped off the unnecessary things. The ideal school house should be situated in a garden of not less than five acres.

The election of officers was next taken up, resulting as follows:

President, P. F. Kinne; Vice-President, G. B. Healy; Treasurer, B. Shontz; Secretary, W. B. Chapman.

Board of Directors: H. N. Antisdel, L. A. Clemons, H. L. Felter, A. W. Hatfield, W. F. Steigerwalt.

WHAT THE YEAR HAS BROUGHT US.

BY J. WAYNE, SAC CITY.

The year 1903 is now history. We have reached another period in our existence and it is well for us to pause and take a retrospective view of its results. What the year has brought us in experience will be ably set forth in many valuable thoughts presented in papers and discussions for our consideration from which practical lessons may be learned by all those interested in the growing of plants and fruits. Therefore we will leave this phase of the question in other hands and will study briefly the ethical side, which I hope will be of equal interest to all our friends.

As we come close to nature and study its wonder-working power in the development of plant life, we are inspired to know more of its mysteries. When we see growing side by side out of the same soil, under the same conditions, apples, plums, pears, and cherries, together with the luscious strawberries, raspberries, grapes and other fruits, temptingly inviting us to a repast spread by the hand of a bountiful Creator, we are filled not only with a self satisfied passing sensation but with a sincere love for our calling and a spirit of thankfulness for the blessings the year has brought us.

Looking Ahead: In the tiny scion we see the bearing tree laden with glorious flowers and golden fruit. In the delicate plant, the blushing rose, the beautiful foliage painted by the Divine artists, unfolding as a lovely garment on the slender stem. We see the glorious sunshine touching with magic wand the hidden forces of nature, sending life-giving currents through tree and shrub and plant. We see the fields of growing grain, the meadows of living green garnished by the rainbow, that fringe of glory with which the Creator spans the arch of heavenly blue; and the sunset with its banks of fleecy clouds tinted with crimson and purple hue; all these the true horticulturist sees from day to day as he studies how to develop and bring to perfection the many pleasant plants under his care.

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Although the husbandman does not always reap the fruit of his labor, for in the present order of things, one may plant, another reap, one may build, another inhabit, still he patiently labors on conscious of the fact that he is a factor in the world's economy contributing in no small degree to the health and happiness of many homes, inculcationg principles of healthfu living that will influence for good, the sons and daughters of men.

Therefore, I have only good words of cheer and courage to offer you today. The many kind words of encouragement we receive from time to time is a large part of our compensation and should stimulate us to still greater efforts on our part to introduce to our patrons the finest and best that nature affords.

Our Society: I will not close without saying the Horticltural society has now a grand field of opportunity opening before it; its far reaching influence is beginning to be felt. I look to see this inviting field extend with the same zeal that characterizes our private enterprises. It is with pleasure that I note the keen appreciation shown by both patrons and public in our good work to ennoble and uplift society.

While the year has brought us many disappointments, its vissitudes have taught us many valuable lessons, and we may now look forward with assurance to a brighter and more profitable future.

"Know that all things come to him who learns to labor and to wait."

EXPERIENCE MEETING.

1. With New Fruits.

MR. ANTISDEL: I received scions of Red Warrior from Mr. Reeves four years ago; it fruited this year and is a fine apple. Price's Choice is a promising apple, something like the Hibernal; fruit resembles the Pewankee in color; season between Duchess and Wealthy; heavy bearer. I have half a dozen specimens of Missing Link, the growth is enormous, four feet in a year; blossomed quite freely last spring, but blossoms were somewhat deformed; no fruit. Sweet Cross, not high in quality, but it bears fruit that keeps; becomes a good cooker late; under ordinary conditions will keep until spring. I have a raspberry from Mr. Caulkins which is proving of value.

MR. WRAGG: We have been propagating this raspberry of Mr. Caulkins for several years. After careful inquiry I made up my mind it is a new thing, originating here, and ought to have a name, so I called it the Iowa. The Crimson Cluster is entirely different. This shows the need of fixing up our nomenclature. This raspberry is a dwarf; sprouts almost none at all and is the deepest rooter I ever saw.

MR. CLEMONS: Since the raspberry originated in this society, why not name it officially? I move that the raspberry sent out by Mr. Caulkin's be named the "Iowa."

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The motion prevailed.

2. *Strawberries.*

MR. STEIGERWALT: The past season has been very wet with us, heavy and constant rains making cultivation on our flat sand almost impossible. Before the berries began to grow squirrel grass got possession of the field. The plants I name I received from Kellogg, of Michigan, in 1902. The Clyde, not many berries, but of vast size; stems weak and berries low on the ground; rot badly such a year as this; poor quality. Cumberland and Nick Ohmer, foliage rusted badly and berries ill-shaped; too wet in time of blooming. Uptodate—I am favorably impressed with this; strong plants, high up; good foliage; good fertilizer; berry good shape and flavor. Rough Rider—I take no stock in this; made no plants to speak of, berries poor. The Excelsior, Clyde and Uptodate I shall continue, and discard the others.

MR. SHONTZ: Discard Uptodate. I have fruited it three years; very shy bearer; berry small, of pale red color; good flavor, but it does not give the berries.

MR. ERWIN: Will Mr. Shontz name two or three varieties for the farmer or townsman ?

MR. SHONTZ: Warfield, Enhance, Dunlap, Bederwood and Lovett. These stand rough treatment and give more fruit than any others for me. I have a sandy loam soil.

MR. KINNE: What would be your list, Mr. Felter ?

MR. FELTER: The same as that of Mr. Shontz.

MR. KINNE: Give me you list, Mr. Antisdel.

MR. ANTISDEL: I would recommend only one, the Enhance.

MR. KINNE: And yours, Mr. Clemons.

MR. CLEMENS: For the farmers' garden I would plant Lovett first, and Enhance second.

MR. WAYNE: Has anyone experience with the Clyde ?

MR. CLEMONS: It is a beauty on the table; makes few plants, but strong and healthy.

MR. SHONTZ: A hard berry to pick for market.

MR. KINNE: Absolutely worthless for me.

MR. HATFIELD: Warfield is my best.

MR. ERWIN: I find the Warfield gives best results on black soil.

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MR. SHONTZ: But it must be fertilized; for one variety I would take the Enhance.

MR. FERRIS: I endorse that. Nearly all our market gardeners are using staminate plants and Enhance leads.

3. With Grapes.

MR. WRAGG: There are parts of Iowa considered equal to any of the grape districts of other states. This is to be found chiefly on the bluffy, loess soil of the Missouri. About Des Moines we have good soil but in limited area. The only place I can succeed with grapes is on high ground, southeast slope, with lots of sun and air. Plant grapes deep; dig a hole two feet deep, plant one year old vines and cut back to two eyes; cut the lower roots to about six inches, the plant will then throw out new roots. The old wood and roots are not of much value. Plant rows north and south and trellis with No. 12 wire. Lay the vines down in the fall and cover with dirt; the next year tie them up on the fan system. Trim back in the fall to two or three buds; spring trimming weakens the plant.

MR ERWIN: In pruning one must keep in mind that the wood growth of this year bears the fruit next year. Mr. Wragg's advice to cut back the roots is sound. It gives a bushy, compact root system and an increase of roots.

MR. GREENE: Does it pay to summer prune ?

MR. WRAGG: No, sir.

MR. GREENE: It is a question simply of the number of clusters and their devolopment. It is a well-known principle that if you want large flowers you must confine the plant to one or two flowers; it is the same with fruit. If you want large grapes you must do summer pruning; the whole strength of the vine should be thrown into a few bunches. We get too much wood growth here. Of course there must be good leaf surface; the fruit should not be exposed by the leaves being cut off; the leaves should protect the fruit from the hot sun. Don't cut away the leaves for the purpose of letting in the sun to ripen the fruit. The fruit will not ripen perfectly under such treatment.

4. With Plums.

MR. HATFIELD: I have had the Miner in Woodbury county for twenty-five years and made good money with it; but of late years it has not done so well. It is a nice plum, about the best

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to eat out of hand. I should like to hear the experience of the members with different plums.

MR. FELTER: My Wyant trees bore this year when others failed. I recommend the Wyant.

MR. KINNE: I consider the Ocheeda a good plum; but its season is the same as the De Soto and other good plums.

MR. FERRIS: I place the Wolf next to the De Soto; a good bearer, good size and quality.

MR. ANTISDEL: The De Soto is the standard plum; it sets too heavy and must be trimmed.

MR. KINNE: Have you Hart's De Soto? I think it an improvement over De Soto proper.

MR. FELTER: I have it and consider it a better tree. In a good blooming season the De Soto needs thinning at least half when the fruit is the size of hazlenuts.

MR. SHONTZ: It does well worked on Miner.

MR. KINNE: The Forest Garden is among the best early plums.

MR. ANDERSON: What is an early plum, what date?

MR. FELTER: August 10.

MR. CLEMONS: Among the cultivated plums I believe the Forest Garden is the earliest.

MR. KINNE: Mr. Anderson has a plum earlier than the Forest Garden.

MR. FELTER: I have fruited the Hawkeye. It is a very large plum, good bearer but low quality.

MR. ANTISDEL: It bore with us this year. It sells well.

MR. HATFIELD: That is my experience.

MR. FELTER: Bears best of any variety with us, except Rockford, which does well with me.

MR. WRAGG: Isn't it too small to recommend?

MR. FELTER: Yes, I thinks so.

MR. HATFIELD: Any one had any experience with Wild Goose?

MR. HILL: It is too tender here, belonging to the Americana family.

MR. WRAGG: I think I have ninety-three varieties on the records that I have tested on the state experiment grounds. Of

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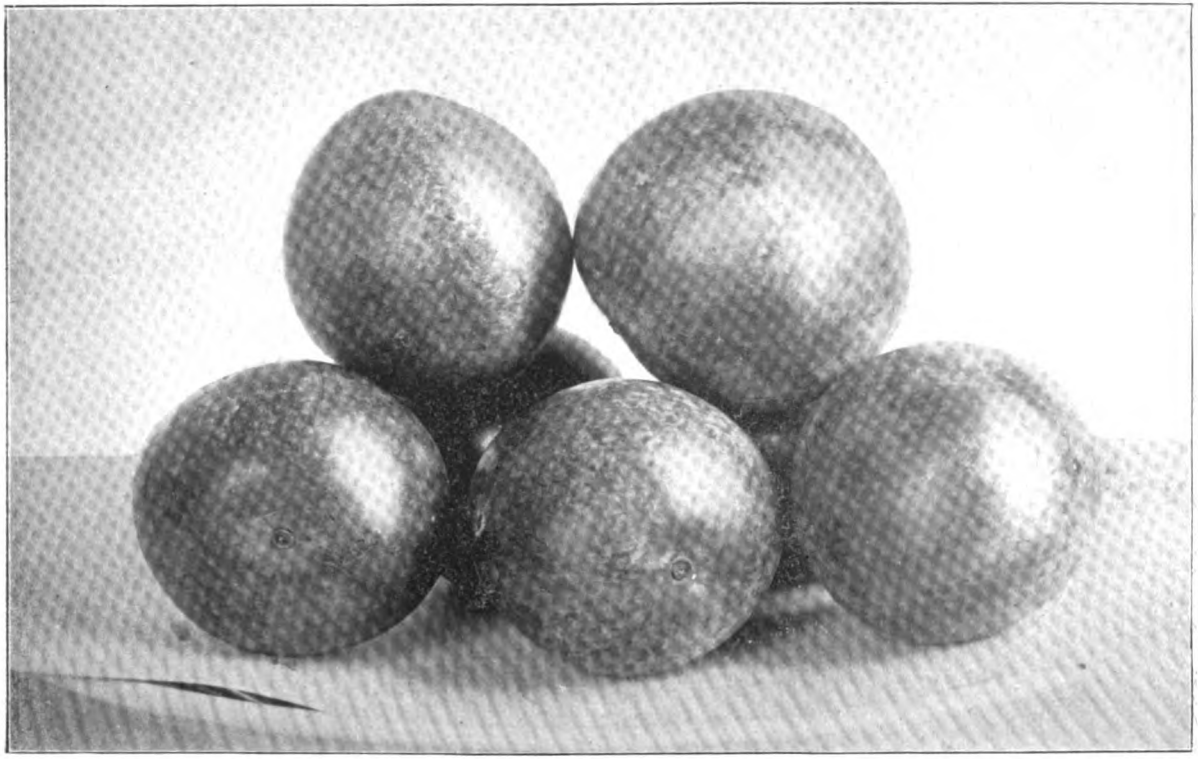

The Terry plum, also known under the name of Free Silver. See page 446.
Photograph from E. E. Little.

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these there are eight or ten good; four or five very good; the remainder of no value in the Northwest. For an early plum, take the Wyant; Miner best late plum if properly fertilized; for a large Americana plum, take the Stoddard. My father got a plum from this county thirty years ago; a small yellow plum, ripening in July; a splendid plum for this section, especially for market. For the county south of here I recommend Hawkeye, Stoddard and Surprise. The Surprise is a splended plum, much better than the Ocheeda or Cheney. The Wolf is not a good tree, weak in vitality and fruit gets small.

MR. FELTER: How is the quality of Surprise?

MR. WRAGG: Good.

MR. CARPENTER: My Miner don't fertilize. Is the Wyant good to go with Miner?

MR. WRAGG: Yes; De Soto is a good fertilizer for Miner.

MR. CLEMONS: I think it unwise to condemn the Ocheeda for this locality. It is a hardy tree with us and fruit of good quality.

MR. ANTISDEL: What about the New Ulm?

MR. KINNE: Too small.

MR. HEALY: The Japan plums, in a small way?

MR. WRAGG: I think the Burbank and Abundance the only ones it is advisable to plant. With good drainage, on a west slope and protected on the south, they will do fairly well.

MR. CLEMONS: Our only plums this year are Japans. I have seven or eight trees and marketed forty bushels in one day. Trees set just after the killing winter of 1896.

MR. FELTER: I have had Burbank and Abundance for four years and they are doing well.

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THURSDAY AFTERNOON SESSION.

NOTES ON CHERRIES.

BY E. E. LITTLE, IOWA STATE COLLEGE, AMES.

One of the best orchard fruits that can be grown in the Mississippi Valley as far north as the forty-third degree latitude is the cherry. Within the past decade the planting of this fruit has been largely increased throughout all sections of this region. Statistics show that in Iowa in 1890 there were less than 200,000 cherry trees growing in the State, but in 1900 the number had increased to nearly 800,000. The increase was quite general throughout the State, except in the very extreme northern part. In some counties the plantings were increased nearly 100 per cent. In the northwest section of the State all counties show a decided increase in the number of trees planted. From statistics I find that the largest increase in this section has been in Boone county, where in 1890 there were only 1,374 trees, and in 1900 there was 13,980. Some of the river counties have also shown as large an increase. The three counties of the State that have the largest number of cherry trees growing are Pottawattamie, Polk and Des Moines. These counties are geographically quite remote, showing that the cherry is grown successfully over a large area. The cherry does not offer the experimental horticulturist the encouragement that the plum does. Of our native cherries very few are of the umbellate type the same as our cultivated sorts are. The Choke cherry and Wild Black Cherry has shown but little improvement where placed under cultivation.

The Sand Cherry of the Rocky Mountain region, which is a low growing straggling sort of a bush, has been of some value in crossing with some of the standard varieties, and the experimenter will doubtless find a great field in the improvement and crossing of this species. There is one variety under the name of Compass Cherry that is already on the market that was produced by a cross between the Sand Cherry and the Miner plum. This variety has not been thoroughly tested yet, but has attracted some attention throughout the west where some of the common sour sort have not succeeded.

Among some of the experimental Horticulturists that have done good work along the line of improving varieties, is the late D. B. Wier, of Lacon, Illinois, who early discovered that to have a good assortment of hardy varieties in the north central states, it would be necessary to produce varieties by selection. In the early 70's he had growing on his ground many thousand seedlings from which there are now a few varieties that have been disseminated and found to be valuable. These are the Northwest, which ripens a little earlier than the Early Richmond variety, and the fruit is of medium size, somewhat heart-shaped in form, and the color is dark red to almost black at maturity. The quality is good and it deserves to be planted in all sections where the standard varieties succeed.

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Two or three varieties that are still under number, such as Weir's 2, 44, and 12. The No. 2 and 44 are two varieties that are very similar to the Early Richmond, and possibly are not superior to this variety. A little later there was an importation of Russian cherries, by Professor J. L. Budd, the former Professor of Horticulture at the Iowa State College. These varieties were widely disseminated throughout the State by him, and have been tested and reported upon. The varieties that seem to be the most promising at the present time are the Duchess De Anjoulem, Sklanka, King's Amarelle, and Early Morello. The first two varieties are a little larger in size than the Early Richmond; and are very hardy and productive. The trees are vigorous and a strong grower. The other two varieties are of medium size and good quality. The trees are very productive and of medium size and healthful. Among some of the varieties that have been grown in the past few years, and disseminated throughout this region and seem worthy of further trial, are the Wragg, which was produced from a sprout of the English Morello, the Timme, Good Speed, Homer, and the Minnesota Ostheim.

A good list of varieties suitable for planting in this section of the State and which cover the whole season are the Northwest, Early Richmond, Montmorency, English Morello, Wragg, and some of the newer varieties that have not been widely grown but deserve to be planted are, Duchess, De Anjoulem, Sklanka, Timme, Homer, and Ostheim.

A small number of varieties should be planted for commercial purposes.

NUMBER OF CHERRY TREES GROWING IN COUNTIES OF NORTHWESTERN IOWA.

Counties.	No. trees in 1900.	No. trees in 1890.	Per cent of increase in population.
Buena Vista	3,021	470	25.8
Boone	13,980	1,374	18.6
Calhoun	7,532	516	41.7
Carroll	6,572	1,865	.....
Crawford	8,717	1,332	5.8
Cherokee	2,778	1,139	7.9
Ida	4,552	983	15.2
Monona	.....	.....	23.9
O'Brien	2,884	115	30.1
Pocahontas	2,445	339	60.6
Plymouth	4,160	45	18.5
Sac	6,251	1,657	21.5
Webster	3,388	635	47.1
Woodbury	8,034	784	1.8
Clay	1,338	79	44.0
Dickinson	16	111	84.7
Emmet	517	15	132.5
Humboldt	1,068	105	28.8
Kossuth	1,455	92	73.2
Lyon	1,307	141	51.7
Osceola	890	29	56.5
Palo Alto	917	43	54.0
Sioux	1,924	274	27.0

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CHERRIES.

COUNTIES OF THE NORTHWESTERN DISTRICT.

Counties.	1900. Number of persons to each tree.	1900. Number of trees per acre.	1890. Number of trees per acre.
Buena Vista	5.62	1 to 122	1 to 784
Cherokee	.6	1 to 125.5	1 to 323.5
Woodbury	6.8	1 to 69	1 to 906
Monona	3.0	1 to 45	1 to 417
Plymouth	5.0	1 to 126	1 to 116.62
Pocahontas	6.0	1 to 150¾	1 to 108 8
O'Brien	6.0	1 to 130	1 to 320.6
Ida	3.0	1 to 61	1 to 295
Sac	3.0	1 to 59	1 to 222½
Calhoun	2.5	1 to 49	1 to 714
Carroll	2.0	1 to 56	1 to 198
Crawford	2.5	1 to 53	1 to 354
Boone	2.0	1 to 26.4	1 to 268
Webster	9.0	1 to 136	1 to 726
Sioux	10	.....	....
Clay	12	.....	....
Lyon	10	.....	....
Osceola	10	.....	....
Dickinson	500	.....	....
Emmet	19	.....	....
Palo Alto	15	.....	....
Kossuth	16	.....	....
Humboldt	12	.....	....

CHERRY CULTURE.

BY M. J. WRAGG, WAUKEE.

This is one of the fruits that requires certain conditions to bring it to its highest stage of development, and we know of no other fruit that will repay the planter so bountifully for his investment, than a few acres planted on the proper soil, with the proper varieties in the cherry growing belt of Iowa. First, let me say that we are, here at Alta, on the northern limit of the cherry growing district of our State. After we pass over the watershed at Cherokee, the cherry belt extends northward as far as Sioux Falls. Cherry growing has also been found very profitable in many places in and about Sioux City, on the high bluff or loess soil of the Missouri.

The cherry belt is generally understood to lie between the fortieth and forty-third degrees of north latitude. This practically limits the area to a strip of not over 300 miles in width, and it is over this strip of territory that the sour cherry grows to its highest perfection.

In speaking of cherry culture and varieties adapted to the northwest, will say that there are no sweet varieties yet, that will grow and bear fruit between the degrees of latitude before mentioned. As they are weak in bud and are not constitutionally adapted to our soil and climatic conditions, but by planting the sour varieties, one may have an abundance of this luscious and healthful fruit.

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The best location for the cherry is a high, dry and well drained tract of land. I am not certain that the exposure has anything to do with it; yet I have often thought that a level tract of land, gently sloping, was the best. I have noticed in some cherry orchards that where the trees were planted on the southern slope, they showed a tendency to sun scald. I thought possibly it was due to the winter suns during February and March; while in the same orchard on the level there were no evidences of this weakness.

In planting the cherry for commercial purposes, I believe in planting them in rows north and south, planting the trees eighteen feet apart in the rows, and the rows twenty-two feet apart; this will give 245 trees to the acre. The cherry should have good, clean cultivation until the branches of the trees are large enough to cover the ground and keep down vegetation. The trees even at this age are best to have cultivation, if you can give it, by using a disk, harrow, or some other tool that will keep the soil pulverized and in a good state of cultivation. I think that we can grow, without any hesitancy in this section of Iowa, such varieties as the Early Richmond, Wragg, Montmorency, Cerise de Ostheim, and there are several of the Russian cherries that are perfectly at home on the high elevations in northwest Iowa, as most cherries grown in our nurseries today are propagated on Mahaleb stocks, it is advisable that they be planted at least four inches deeper than they grew in the nursery; or at least the stock that the cherry is worked on should be from two to three inches beneath the surface. This serves a double purpose by giving the tree a chance to get on its own roots, which in my opinion adds to the hardiness of the tree. I believe that in the cultivation of a cherry orchard, it is advisable to plow to the tree so as to get the trees well banked. After being cultivated in this manner for three or four years, they will get a surface drainage so that no water will stand near the trees.

Plant out low-topped, four to five feet trees, give them good cultivation and keep your knife in your pocket, for the cherry requires no pruning and are best to grow naturally.

As to the profits, will state that a man living near Des Moines the past season, marketed his cherries from an orchard that had been planted but five years, which yielded him an average of twenty-four quarts per tree. These cherries sold in the market at eight cents per quart; and with 240 trees to the acre, one can readily see that the handsome income of $560.80 is no small matter. Of course, there is the expense of baskets, picking, and marketing. But as we said at the outset of this article, we know of no other variety of fruit that will bring so great a reward as a few acres planted with this luscious fruit.

MR. HEALY: Mr. Stone of Sioux City has a cherry orchard in bearing fourteen years and he told me he had kept an account of the fruit sold and each tree has averaged $2.50 a year. He considers the Early Richmond the best. The trees are perfectly sound now.

MR. CLEMONS: What will be the result of the tree from continual leaf spot?

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MR. LITTLE: The tree will be gradually killed. This disease is more common during a wet season. It can be held in check to some extent by spraying with Bordeaux mixture.

HORTICULTURE AS AN AVOCATION.

BY G. B. HEALY, SIOUX CITY.

When I was requested by your Secretary to write something in the way of a paper on "Horticulture as an Avocation," he saying that it would be followed by a paper on "Horticulture as a Vocation," the old conundrum occurred to me, "What is the difference between a farmer and an agriculturist?" the answer to which is "A farmer is one who earns his money in the country and spends it in the city, while the agriculturist is one who earns his money in the city and spends it in the country." It occurred to me that a similar conundrum might be asked of the difference between horticulture as a vocation and an avocation and a like answer returned. However, we all earn money to spend somewhere, and it might be spent in many a worse place than in the country. I knew an old gentleman in Sioux City who had acquired great wealth and who rather boastingly said to me one day, "I attribute my success largely to the fact that I have never learned the art of spending money." This remark from him seemed to me to betray a weakness rather than suggest a strength of his character. He had indeed learned well the art of making money, which, however, only constitutes one half of a man. The art of spending money is equally important. For of what advantage is wealth if not put to good uses?

That there is a certain refined pleasure in gardening is well attested. Diocletian, one of the greatest of Roman emperors, after a most successful reign of twenty-one years, and after having organized the empire in two parts with Augustus and Caesar in control, abdicated and retired to his Dalmatian estates, where he spent the remainder of his life in quiet horticultural enjoyment. When his former colleague Maximina sent to him, urging that he again assume the reins of government he returned the following characteristic reply: "If you would come to Salona and see the vegetables I am raising with my own hands you would not talk to me of empire."

Francis Bacon says: "God Almighty first planted a garden, and indeed it is the purest of human pleasures; it is the greatest refreshment to the spirits of man; without which buildings and palaces are but gross handiworks, and a man shall ever see that when ages grow to civility and elegancy men come to build stately sooner than to garden finely; as if gardening were the greater perfection." A writer in the Spectator aptly remarks: "I look upon the pleasures which we take in the garden as one of the most innocent delights in human life. It is naturally apt to fill the mind with calmness and tranquility, and to lay all its turbulent passions at rest. It gives great insight into the contrivance and wisdom of Providence, and suggests innumerable subjects for meditation." Cicero declares that "Nothing can be more rich in use or more elegant in appearance than ground well

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tilled, the enjoyment of which in old age so far from being an obstacle, that it is even an invitation and allurement."

The wisest and best men in all historic time have been warm in praise of this most innocent and healthful form of amusement and recreation. Statesmen, warriors, philosophers and men of letters have been numbered among its votaries. It is communing with Nature, an embrace of our Universal Mother. It has always been a solace to the infirm, and invigoration to the strong and a joy to all.

It is related that when Lysander, the great Lacedaemonian, visited Cyrus, the Persian King, at Sardis, he greatly admired the elegance of his gardens and the skill with which they had been laid out. When asked to whose skill it was due, Cyrus replied that he had both laid out the garden and planted many of the trees with his own hands. Lysander, observing the elegance of his royal robes, was astonished, and declared, "Oh Cyrus, they truly report you as happy, since excellence is combined with your fortune."

The ancient gardens of Babylonia and Persia were marvels of sweetness and beauty.

> "There were gardens bright with sinuous rills,
> Where blossomed many an incense-bearing tree.
> And there were forests ancient as the hills,
> Enfolding sunny slopes of greenery."
>
> *Coleridge.*

Greece copied largely from the East but turned her attention more to works of art. The Romans borrowed ideas and adopted horticultural designs and methods from their conquered territories; and their gardens, villas and country homes were exhibitions of exquisite horticultural taste and refinement. The greatest of the Romans enjoyed these quiet retreats to the fullest extent. The Dutch, English and French peoples have also given much attention to horticultural pursuits. The present is, however, a commercial age. Great consolidations of capital and concerns obtain. The sole aim and object of our commercialism seems to be the piling up of immense riches and its vulgar display. Smaller business concerns are being absorbed by gigantic trusts. Watered stocks are worked off on a gullible public. Mushroom millionaires are making ostentatious display of these suddenly acquired spoils in million-dollar palaces, in automobiles and yachts. Freak offspring of these modern Princes of Finance are regaling the public with uncouth exhibitions of midnight revels and monkey dinners. We should not complain. Refinement of expression can hardly be expected where there is naught but grossness within. Let us not be pessimistic. This social condition of our four hundred does not fairly represent the true manhood and womanhood of our country. At the most it is but a passing scene in the great drama of American life. The virility and force that moves the nation is of the masses in whose unpretentious cottage homes love and virtue abide and life is at its best, and from whose ranks rise up in the hour of peril Lincolns to preserve the nation's integrity.

This is an age of wonderful activity. The fierce struggle of business competition induces premature age and decay. On this business machine we should place a safety valve of rest and recreation. Too many of our

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physically broken down men of affairs are seeking "Rest Cures" after it is forever too late. Helpful rest is found in change of activity rather than absolute idleness. To acquire fame and fortune first which shall be lazily enjoyed afterwards is a puerile and immature conception. "Trust no future, howe'er pleasant, act in the living present." When Pyrrhus was about to invade Rome his friend Cineas asked "What shall we do after we have conquered the Romans?" "We will then subdue Sicily." "And then what?" "Carthage and Libya." "And after that?" "Subjugate Macedonia, completing absolutely our conquest of Greece." "And after we have done all these things, what next?" "We will then live at our ease, my dear friend, and drink all day, and divert ourselves with pleasant conversations." "Then why not rest now and make merry with our friends since we possess all the things necessary therefor?" The Pyrrhus plan of life was for him, as it has always been, a failure.

Bread-winning is a necessary duty. A large part of life must be spent in providing things to eat, drink, clothe and shelter. It is undoubtedly true that perfect success is only attained when these necessaries of life are acquired along the line of work that is most congenial to our tastes, yet we are not all so fortunate. We have passed along the line of least resistance and find ourselves engaged in uncongenial avocations which have been thrust upon us by opportunity of circumstances that seemed to offer the best chance to acquire a living. Since these things are so is it not well that we should choose something as an avocation the doing of which is a joy. To those who select horticulture I suggest the following: First, if a lawyer, doctor, minister or merchant, procure a suitable tract of land—if a farmer, of course the land is at hand. This selecting of a suitable piece of ground should be done with some care, and it should not be too far from the home place. It should have suitable slopes, soils and protection for the fruits he desires to grow; and one engaged in horticulture as as an avocation should grow a little of everything that seems possible in his latitude. It is his duty to experiment somewhat for his own and others' benefit. He can afford to do this since he does not depend on the results of this part of his labor for a livelihood. After his having settled the location it is well to learn as much as possible of gardening and orcharding. For this purpose I know of no better way then to connect one's self with the horticultural society in the immediate vicinity. Take an active part in the work of such society. Do not be a sponge entirely and expect to absorb information only. Radiate a little also. Give out all the information at your command. Emerson has said, "The only way to have a friend is to be one." This is true also of knowledge. "Ceasing to give we cease to have." Experiment, investigate, find out, the best things to grow and how to propagate them successfully. When you have found something, pass along the information for others' benefit.

Having the land and some knowledge on the subject, we require plants and trees. Here is not the place to be either penurious or careless. A few dollars saved in the price of plants or trees may result in serious loss and grievous disappointment. Get the very best possible of the several kinds you wish to plant. Do not be sparing of trouble or money. Buy of no one but from those of well-known responsibility and honor in the business. Shun the tree agent as you would the devil and his emissaries. When plants and trees

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have been procured and the ground is in excellent condition to receive them, do not plant by proxy. Do it with your own hands. It is as unsatisfactory and dangerous to garden by proxy as to court by proxy. Woo the soil and trees as you would the heart of a maiden. Give the very best that there is in you and give yourself. Do not be in a hurry. Dig a good capacious hole for the tree. See that the proper nourishing soil is carefully and firmly placed around the roots. Give every plant and tree a chance to do its very best. Cultivate excellently and prune with loving care and your reward will be great. Remember that *you* are in horticulture as an *avocation*. *You* are doing it for the very joy of it. There is no joy in failure. Joy comes of succeeding.

It may be that it is not convenient for you to obtain or cultivate a tract of land suitable for horticultural purposes on anything like a large scale. It is, however, within the reach of all to make the home grounds, whether large or small, attractive and beautiful. There are hosts of beautiful roses, perennial plants and flowering shrubs that can be successfully grown in northwestern Iowa. Perennial plants are in many respects the most satisfactory. They continue with one faithfully year after year like old friends.

There should be plants in a well ordered garden for every season of the year. For early spring there are the hyacinths, crocuses, tulips, daffodils, etc., and following them along through the spring, summer and autumn season come others in turn, not forgetting the evergreens for the winter months.

Do not try to complete your garden in one year. Plant a few well selected perennials each season with your own hands, and cultivate them yourself. Let your taste and love for those things develop along with your garden. We love most those persons and things for which we do most. By planting, manuring, watering, trimming, protecting and fighting its numerous enemies you will come to love and cherish each individual rose and plant under your care. The lovely color tints of one, and the rich fragrance of another will interest and delight you as you go about among them.

Sioux City has organized an association to encourage this adornment of the home grounds. Auxiliary societies have also been formed in two of its most beautiful suburbs, Smith's Villa and Morningside, for the same purpose. These societies are organized with proper officers, and the members mutually advise and assist one another The best seeds and plants are obtained in wholesale lots and distributed. Funds are raised by membership fees and contributions. Individuals are stimulated to generous emulation by prizes offered for the best results obtained. The writer, who was one of a committee appointed to award prizes for the best kept and most attractive grounds, was surprised to find what wonderful improvement had been accomplished in one season. The grounds around modest cottage homes, with trifling outlay, had been transformed into veritable bowers of beauty. What is being accomplished in the suburbs of Sioux City can be easily repeated in every village, town or city, and with even greater ease and perfection on every farm home of our beautiful prairies, where the rich soil so readily responds to the call of man.

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HORTICULTURE AS A VOCATION.

BY J. C. FERRIS, HAMPTON.

Being advised by my friend, your secretary, that this topic had been given me, I consulted Noah Webster for inspiration and learned that vocation means summons, call, inducement. A word that includes profession as well as mechanical occupation. Active horticulturists know that our vocation involves considerable mechanical occupation. In all civilized lands the most refined of both sexes resort to the culture and care of flowers, gardening, lawn making, orcharding, etc., for recreation, finding the necessary labor only healthful exercise and each exercise a pleasure.

No one can associate with the beautiful in nature without becoming better for such company, and this is especially true of those who mend nature's conditions and train the beautiful things that grow to make them more beautiful. He is fortunate who can make beautiful things useful, and the useful beautiful. He is indeed more fortunate who has been called to make this refining avocation his chief vocation, thus making his daily labor a labor of love. But few combine in themselves the elements necessary for success. An amateur may have tastes and skill; a rascal may be a good financier, a disagreeable boor may have business faculties, but he who makes horticulture a successful and pleasurable vocation must combine all the virtues named and besides he must have boundless energy, and above all integrity.

Some aspiring souls have failed through possessing all these attributes because they have tried to lift their vocation out of the mire of modern business competition. Their ideals have been true and perhaps practical with fair competition, but they could not apply the ethics of Christ and compete with the necessities of Satan who have degraded their horticulture to the hand of a confidence game. True horticulture is a noble vocation and would be so regarded by the whole public if it did not have to answer for the sins of those who masquerade under names they are unworthy to bear.

As the undiscriminating public is disposed to saddle all these sins upon us I am constrained to say with regret that after more than a quarter of a century of experience I cannot advise those who want to get rich to choose horticulture as a vocation. True, some honorable men have become rich without descending from the high plane of their ideals, but such men began before the present despicable, villainous, brutal methods of disposing of our products were in vogue. The true horticulturists who love and who honor their profession have long been hoping against hope that the public would discern the difference between fair and foul methods of soliciting trade, but we find it true that a sucker is born every minute, and it is equally true that a sharper is born every hour to angle for him with a hook baited with transparent lies. Sixty to one but the one prevails for suckers still bite. Brethren, are we blameless? Have we not given employment to liars? Have we not filled orders procured by methods to which we could never descend? If you feel like censuring me for asking these questions, let him who is without sin cast the first stone, I am not blameless.

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What is the remedy? An effort to drive the scalpers from the field by refusing to fill their orders, or sell them stock? Why they can get them filled in other states. Shall we employ only practical and experienced men who have made horticulture their vocation? He cannot persuade them to travel and compete with knaves until the patronage is educated to know the difference. I beg you brethren do not infer that I would discourage horticulture as a vocation. There are some sunny as well as shady places in our field of labor. This is one of them and this is the remedy: Educate the public to "ring out the false. Ring in the true." I repeat I cannot advise those who want to get rich quick to choose horticulture as a vocation. But some of our young men do not desire great riches, and they are wise. Happiness is the goal we all aspire to. He whose daily wants are comfortably supplied and who has a competence for old age is happier than the millionaire who has let the inspiration of greed crush out all the nobler aspirations born in the day dreams of youth and innocence. To one who feels that he is called and qualified to engage in a labor of love and who can learn to love the things he trains and cares for, and protects, I know of no nobler life work than horticulture as a vocation.

But in behalf of the noble men living and dead who have honored any profession, we beg you who think you are called to any chosen and honorable field of labor, bring honor with you, or disregard the call, and choose some other vocation.

Brethren, I have been talking to you, now a word to the public: Every well informed horticulturist who has pride in his vocation will tell you the truth as he sees it. A sharper does not take the trouble to inform himself, He is and wants to be only sharp. That is his vocation. Well, that pays best in dollars, but a gentleman cannot afford to barter honor, self-respect and integrity for dollars.

One who loves his kind will rather die poor, leaving only the heritage of that love returned to honor like a benediction over his memory, than have millions to vex the souls of his kindred to the dividing, and a memory stained with dishonor or with doubt as to the methods by which the millions were acquired. Such men have no place in horticulture, but honorable men find great pleasure in horticulture as a vocation.

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PROCEEDINGS

OF THE

Northeastern Iowa Horticultural Society,

HELD AT

DECORAH, IOWA, DECEMBER 16, 17 AND 18, 1903.

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OFFICERS FOR 1904.

PRESIDENT.

W. H. Guilford.....Dubuque

VICE PRESIDENT.

Rev. C. A. Marshall..... Cresco

SECRETARY.

John C. Ferris.....Hampton

TREASURER.

E. Blakeman .....Decorah

BOARD OF DIRECTORS,

First District—J. B. Mitchell.....Cresco
Second District—W. A. Burnap.....Clear Lake
Third District—G. A. Ivins.....Iowa Falls
Fourth District—C. H. True.....Edgewood

The next session will be held at West Union, December 14, 15 and 16, 1904.

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LIST OF MEMBERS OF THE NORTHEASTERN SOCIETY FOR 1904.

LIFE MEMBERS.

Brown, Eugene.....Mason City
Burnap, W. A.....Clear Lake
Ferris, S. W.....Hampton
Greene, Wesley.....Davenport
Mott, D. W.....Hampton
Patten, C. G.....Charles City
Parker, A. T.....Mason City
Parker, H. G.....Mason City
Reeves, Elmer M.....Waverly
Secor, Eugene.....Forest City
Sherman, E. M.....Charles City

HONORARY LIFE MEMBERS.

Babcock, Mrs. Nancy.....Nora Springs
Gaylord, Edson.....Nora Springs
Heisz, Dr. E. H.....Nora Springs
Kenyon, O. A.....McGregor

HONORARY MEMBERS.

Antisdel, H. N.....Fostoria
Highby, L. P. H.....Albert Lea, Minn.
Holway, Mrs. E. W. D.....Decorah
Newens, Professor.....Ames
Phillips, A. J.....West Salem, Wis.
Toole, William.....Baraboo, Wis.
Willett, Rev. M.....Decorah

ANNUAL MEMBERS.

Anderson, W. A.....West Union
Barnes, Merrill.....Cresco
Barsheimer, Amcen.....Decorah
Blakeman, Ed.....Decorah
Bentz, A. E.....Cresco
Bue, Nels O.....Decorah
Ferris, J. C.....Hampton
Farnsworth, E. P.....Cresco
Frelhem, J. H.....Decorah
Glise, G. W.....Marble, Minn.
Gifford, T. J.....Decorah
Guilford, W. H.....Dubuque

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Haugen, P. E.....Decorah
Hanson, Frank.....Decorah
Ivins, G. A.....Iowa Falls
Johnson, Isaac.....West Union
Jargenson, J. O. F.....Nardness
Jacobson, Abraham.....Decorah
Little, E. E.....Ames
Marshall, C. A.....Cresco
Moser, Joseph.....Calmar
Mitchell, J. B.....Cresco
Neilson, J. P.....Calmar
Platt, M.....Oelwein
Reed, D. E.....Decorah
Symmons, W. T.....Decorah
Schmidt, A. C.....Wadena
Schindelar, Albert.....Calmar
Triggs, J. S.....Rockford
Van Pelt, J.....Decorah

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LIST OF PREMIUMS.

Premiums to be awarded at the twentieth annual session at West Union, Iowa, December 14, 15, 16, 1904.

Best collection of apples grown by exhibitor	$6.00
Second best collection of apples grown by exhibitor	4.00
Best collection seedlings grown by exhibitor	2.00
Second best collection of seedlings grown by exhibitor	1.00
Best seedling not exhibited prior to 1899	4.00
Second best seedling not exhibited prior to 1899	2.00
Best collection of apples recommended for Northeast District	3.00
Second best collection of apples recommended for Northeast District	2.00
For every variety, same as above, each plate	1.00
Best ten plates other varieties worthy cultivation, each	.50
Best display canned fruit and jellies	3 00
Best display cut flowers	5.00
Best specimen plant in bloom	1.00
Best new plum, origin and history to accompany exhibit	2.00

All apples competing for premiums must be grown in Northeastern District, and all new seedlings must be accompanied by a statement of origin, history and nature of soil and climate in which grown.

Four apples shall constitute a plate and each variety must be correctly named.

Flowers and plant premiums open to every one; fruit premiums only to those who become members.

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PROCEEDINGS OF THE

Nineteenth Annual Session

OF THE

Northeastern Iowa Horticultural Society,

HELD IN

Decorah, Iowa, December 16, 17 and 18, 1903.

WEDNESDAY AFTERNOON, DECEMBER 16TH.

The annual session was opened at two o'clock, P. M., in the Grand Opera House, at Decorah. The invocation was pronounced by the Rev. C. A. Marshall, of Cresco. The attendance was fair for the opening session. President E. Blakeman and other members of the Winneshiek County Horticultural Society were there to greet and welcome us, and many of the old charter members were present. One of them, President Elmer M. Reeves, was in the chair. He called for reports of directors, and the reports of districts one, two and three were read.

REPORT FROM DIRECTOR OF THE FIRST DISTRICT.

BY J. H. UPTON, CRESCO.

The year 1903 has been rather a poor year for the fruit grower, although he has been fully as successful with fruit as the farmer with field crops.

The apple crop varied greatly. In some places a good crop and in other places almost a total failure. Early apples generally were a good crop. In some places the late apples were a good crop but in most places the yield was light and the apples more or less scabby. Plums and cherries were al-

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most a total failure, probably owing to the late freeze. A large per cent of plum blossoms set fruit which soon fell from the trees. Currants and gooseberries were almost a total failure on account of the blossoms being killed by the late freeze. Raspberries were a light crop, in my opinion, owing to the warm weather we had in the winter, which thawed in the middle of the day and froze nights, the freezing and thawing so injuring the bushes that a good many were killed. The only raspberries that produced fruit to amount to anything were, in black, Older and Cumberland, and in red, Cuthbert and Turner, and Golden Queen in yellow. Blackberries bore a very large crop; the continued rains furnishing sufficient moisture, and there were fresh blackberries on the market for two months. Grapes were a light crop in most places and in some places rotted badly. Strawberries were about an average crop; in some places yielding enormously and in other places almost an entire failure. Some places where covered they killed out and in other places bore well without any protection and some were a total failure; what caused the difference is hard to tell.

REPORT FROM DIRECTOR OF THE SECOND DISTRICT.

BY W. A. BURNAP, CLEAR LAKE.

This season with us has been one of ups and downs, brilliant anticipation and severe disappointment. The spring promise for all kinds of fruit was bright. All varieties indicated bountiful crops and we began to figure out what we would do with all the money we would receive for it, and then came a frost, or blight, or scab or something, and our hopes fled. Strawberry blossoms that were open when the frost came were all killed, but enough remained to set and mature a good average crop, for which fairly good prices were secured. Raspberries, owing to root injuries and other causes, almost completely failed. Plums and cherries were very few and far between. Grapes, about one-half crop, imperfectly ripened; and when I add that only here and there thoroughout my district in scattered and peculiar locations were any apples of value secured, the tale of woe is then complete.

The scab or injury to our apple crop was so serious, both for this and future years, that neglecting all other conditions of our fruit crop your director has devoted what time and means he had at his disposal to an investigation of this one question. He considered this matter as the most important coming before this or any horticultural meeting this year, and having secured a place upon the program for the subject will at this time refer all members to that hour for the full discussion which he hopes to then develop.

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REPORT FROM DIRECTOR OF THE THIRD DISTRICT.

BY G. A. IVINS, IOWA FALLS.

If we judge the past season as being an average fruit year, it would hardly prove to be a fact in the district I represent; although during a number of years since I have grown fruit in Iowa, the yield has been far below what it was this year. Last spring the bloom of tree fruits was generally quite heavy, and nearly all varieties of apples set from a fair to a full crop. All the early varieties averaged a fair crop of large, perfect apples, and readily sold for 50 and 60 cents per bushel. The Wealthy bore a good crop, but fully one half of the fruit was so scabby and imperfect that the only use that could be made of it was for vinegar. The balance of the crop was sold for 60 and 75 cents per bushel. Longfield matured a heavy crop of fine perfect apples, although size and color are against it as a market apple. A large apple of good color and quality, will sell more readily than a small apple with fine qualities. The Northwestern Greenings generally bore a good crop, but in some localities they were very scabby and imperfect, while in others they were smooth and nearly perfect. Malinda and Annette were so deformed that no use could be made of them. During the bloom of our winter varieties we had the heaviest rains, and this may have been the cause of so many being imperfect.

Cherries were simply a failure, and plums were a very light crop. On my ground the Stoddard and Wyant, Hawkeye and Miner, were the only varieties that bore fruit, and in quality and large size they were extra fine. They readily sold for $1.50 per bushel, and the trade was not half supplied. Grapes set a fair crop, but continued rains caused rust on the leaves, and the crop was late in getting ripe, while quality was poor. Generally strawberries were a very good crop, and home grown berries sold for 10 and 12½ cents per quart by the case. On my ground several of our best staminates only set a light crop, and many of them were imperfect. The varieties that bore heavy crops, were Crescent, Clyde and Haverland. Raspberries were only a light crop, and sold for 12½ to 15 cents per quart. Columbia yielding the largest crop of all. Currants and gooseberries were a complete failure, caused by heavy, early freeze. Owing to constant rains, spraying could not be thoroughly done for best results.

J. C. FERRIS: I am surprised to hear such a tale of woe from directors both north and south, and so near Hampton. We had a good crop of some kinds of apples. Of course, we had scab, and it was bad on some varieties. As I have adversely reported on Patten's Greening, I want to report it this year one of my best bearers and nearly free from scab.

MR. PATTEN: The more exposed orchards suffered least from scab. The Northwestern Greening was nearly clear at Charles City. The exposed trees suffered loss because the flowers dried more quickly.

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PRESIDENT REEVES: I want to say something about Patten's Greening. I think it is the most valuable cooking apple the North has.

MR. ISAAC JOHNSON: It seems as if we are getting more and more of scab. I found the Patten's Greening very free from scab. Where densely crowded they were scabbed some. Tetofsky and Duchess were nearly clear.

MR. BURNAP: I drove many miles to find apples free from fungi. In fact, I drove all day trying to find a car load of apples fit to ship and failed.

MR. PATTEN: I think Mr. Reeves has said more in praise of Patten's Greening than I ever did. I said at the State society that it was free from scab, and I would have been justified in saying much more than I did in its favor. It seems to me that apple scab is similar in character to wheat scab, the same conditions that produce scab on wheat produce scab on fruit. As we go farther from the lakes we have more of this trouble. When a portion of the pollen is destroyed the spores are killed. This is owing to a condition of the weather. Some years ago when Duchess was injured, Patten's Greening was perfect.

MR. ANDERSON: A few years ago I did not think much of Patten's Greening but I now regard it with more favor. I also like Fameuse No. 1 and Duchess No. 6.

MR. BURNAP: I am glad to hear a good word for Fameuse No. 1.

MR. JOHNSON: Fameuse No. 1 is an annual bearer and a good apple.

MR. TOOLE: Fameuse No. 1 should have a name. Its season is about September 1st.

MR. JOHNSON: It keeps well for an early apple.

MR. HIGHBY: We like the Hibernal in Minnesota for a cooking apple. This season Hibernal sold at three dollars per barrel. It is a good stock to top-graft, because of its strong limbs and forks. Lowland Raspberry and Longfield are also good stocks to top-work.

MR. JOHNSON: I have had some satisfactory experience with Hibernal as a stock, but do not think much of the fruit, yet it is a good cooker and sells well.

MR. HIGHBY: The Hibernal does not turn dark when cooked. Its sauce remains white.

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MR. GUILFORD: Repka, Kievskoe, Longfield and Antonovka are good sorts. Antonovka rots badly at the core.

MR. JOHNSON: It keeps as well as Wealthy.

MR. PATTEN: Fameuse No. 1 stands alternately in the same row as the Fameuse. The Fameuse apple was so scabbed as to be worthless, while Fameuse No. 1 was perfect. I have Duchess No. 6, in three different places and closely planted, yet they are practically free from scab or leaf injury. This perfect foliage is no accident. It is the law of varieties manifested in its best form. By a series of breeding this quality can be developed and fixed in our improved fruits.

MR. BURNAP: Mr. Patten, what has become of your Brilliant?

MR. PATTEN: It is in an unfavorable situation. The fruit was affected, which I think was due to imperfect pollination. The fruit may be kept until June. It seems to be a pure seedling of Fameuse, but is one-third larger.

Mr. Ivins' paper deserves more attention, as he seems to be doing a good work in strawberries, plums and apples. He says we have much to contend with. That makes us strong. If we would give the same care to fruit growing that we give to other industries we could do much more than we dream of.

Mr. Ferris says we have passed that stage. We may breed new fruits with the same confidence in results that the stock breeder feels when crossing different breeds.

PRESIDENT REEVES: Our work requires specialists and we are fortunate in having with us the pansy specialist from Wisconsin. We would like to hear from Mr. Toole.

MR. TOOLE: Mr. President and Gentlemen, I am glad to meet with you and I am indeed thankful for your words of welcome. Perhaps we of Wisconsin are not doing such systematic work as we should, but we are all active. I have experimented in other lines than pansies. We are looking for that ideal winter apple and we expect to find it.

MR. BURNAP: How big a pansy did you grow last year?

MR. TOOLE: Two and three-fourths inches in diameter. I have grown nearly three inches. If you get over two and one-fourth inches you have a large flower, but fine coloring and form are more to be desired than great size.

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PRESIDENT REEVES: I said our work requires specialists. We have another from Wisconsin, and I know we all want to hear from Mr. Phillips.

MR. PHILLIPS: I am glad I came here, and I am glad I went to Minnesota and met Mr. Patten there. I have never heard so many good words for Patten's Greening as I have this year. Mr. Patten should go on with his work. Mr. Ivins seems to be doing a valuable work in seedling productions. So is Mr. Yahnke of Minnesota, and others up there.

MR. FERRIS: Is not the Black Ben Davis identical with Gano?

MR. PHILLIPS: Van Deman says it is not.

MR. IVINS: I want to correct a mistake I made last year. I took a four dollar premium on a seedling as No. 10. It was not No. 10, and I want to return this money. (Hands secretary $4.00.)

MR. FERRIS: I do not think the society wants Mr. Ivins to return money taken as a premium on a seedling because he made a mistake in the number.

PRESIDENT REEVES AND OTHERS: Certainly not.

(Secretary returns the money to Mr. Ivins.)

SECRETARY'S REPORT.

Mr. President and Members of the Northeastern Iowa Horticultural Society: After fifteen years I again assume the duties of secretary, in which capacity I had the honor to serve you during the first three years of the experience of the "Northern Iowa Horticultural Society," as this society was named at its birth and called for a number of years. The old members who sat in the first meeting at Hampton will remember that we predicted a career of usefulness for the young society of the north. Our ideal has been realized, and I am sure those who have since joined our ranks will rejoice with us as they read our record of achievment to which many of them have so ably contributed. Old friends, we may be pardoned for looking back with pride. New friends, join us while we look forward with hope, and help us with your council to the end that our hope end in fruition. Help us to advance north Iowa horticulture at the rate that it has been advanced since we organized nearly twenty years ago. Then we timidly recommended four summer and fall apples as suitable for general planting. Now we can confidently name a dozen and many of them winter apples. We have promise of many more and we earnestly solicit your aid in selecting them, and demonstrating their nature. Then we only recommended a few of the Americana species of

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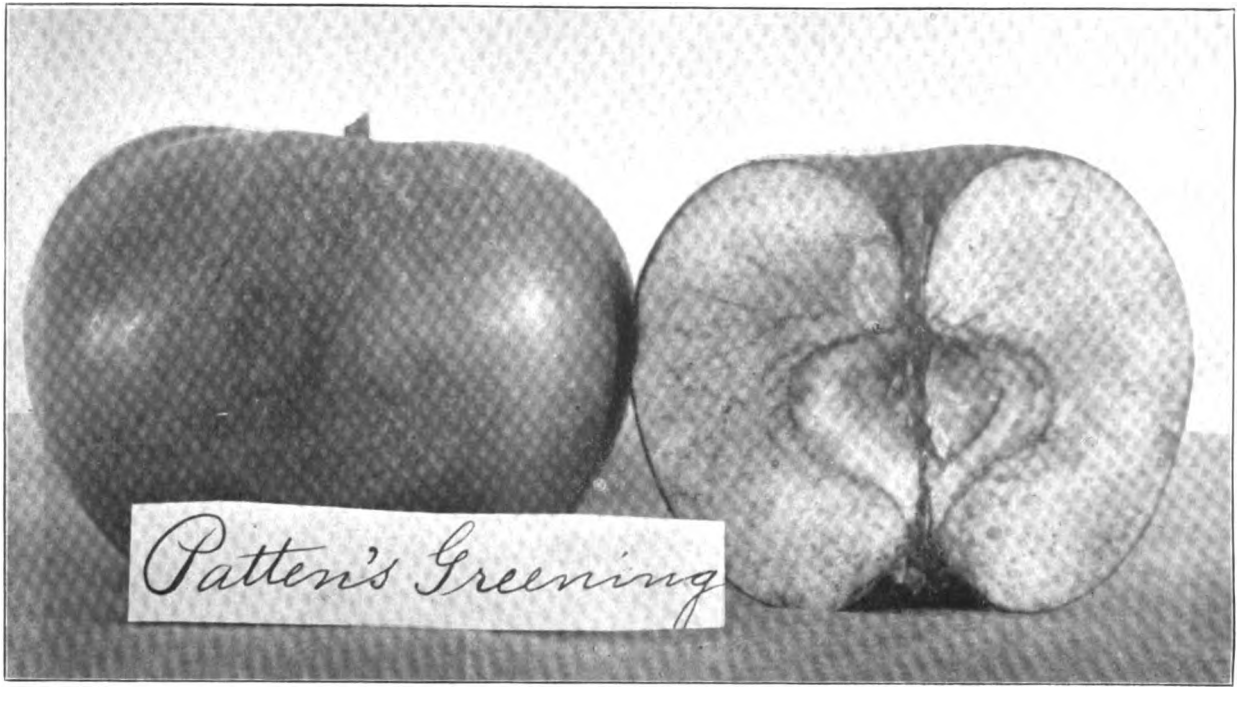

From Duchess of Oldenburg seed supposed to have been crossed by Rhodeland Greening. A hardy variety in Northern Iowa. **See page 447.**
Photograph from E. E. Little.

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plums. Now we know many of the choice type that are of value, and so along all lines, we have experienced and compared notes to our mutual advantage and to the great advantage of the hosts who read our volume of transactions and profit thereby.

I cannot go into the details involved in so long a period. Those who have served you as secretaries have from time to time given valuable and able reports of our progress. Neither will I attempt to report on the conditions prevailing since our last meeting at Nora Springs, Our directors' reports will give you that information. I will only call attention to one line of effort initiated at our last meeting. We have begun a systematic investigation to learn what is being done by seed planters. While importations of the best of all lands should be tried and proven and the best selected, we all know that the great rock upon which the future horticulture of the world must rest, is the planting of seeds, and the selection of the best.

All honor the men who are making this their life work. Let us award them the meed of our praise. Posterity will rise up and call them blessed.

Your secretary has but one suggestion in the nature of a recommendation. It is that our constitution and by-laws be so amended as to adapt themselves to our changed conditions. I had the honor to draft them and know they are not altogether appropriate for the needs of the Northwestern Iowa Horticultural Society.

PRODUCTION OF NEW VARIETIES.

BY G. A. IVINS, IOWA FALLS.

Regarding the importance of the subject, the people, one and all, should be more interested. Here is the wide field and plenty of room for us all to work in. None of us have yet reached the highest pinnacle of intelligence regarding any fruit. Evolution along this line is not a two-minute race horse, but should the originator reach the mile post in an average life-time, and should he be fortunate enough to bring into existence one or more varieties, that in the natural event of time would prove of value; the law of selfishness would never give him credit until his tombstone had become moss-covered by the elapse of time. We see in the board domain where naturalists have achieved laurels, and others by their inventive genius have produced marvelous results; yet may have died almost paupers, such in reality is a dark cloud in the history of the world.

But the subject assigned me is of more importance than dwelling upon indisputable events of the past. Since my association with you I have been known as a grower of small fruits, and to some extent this has been my work for years, but it is only a small part of my work today. Some of my time has been devoted to growing many thousand seedling strawberries, and from them quite a number of very promising ones have been selected, and thus far have give some promise of value. I do not claim to have originated any one variety that is perfect in every respect. If perfection was gained in every respect in a single variety, there would be no need for any

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one year after year to plant the seed and nurse the infant plant to maturity. This work has been done by selecting seeds from our best varieties, also by cross-fertilizing.

My greatest success was achieved in crossing on the Bubach, getting two varieties which were very productive, and the largest berries I have ever seen growing. The picking season of these two continues fully three weeks, and the last pickings are good marketable-sized berries. They are staminates, and fair to good plant makers. Bubach was chosen for the parent plant for two reasons, namely: heavy, thick foliage, and uncommonly large berries. In some of our varieties the foliage is too large, shading the fruit too much for high color and good quality of fruit. This was one of the weak points of the Bubach; while other varieties do not shade the fruit enough, but leave the fruit exposed to the hot sun. In choosing Bubach for the mother plant it gave me a thick firm leaf of medium size, and in the main rust proof. It is absolutely necessary with any variety to have free circulation of air and heat from the sun for high color and good quality. Among other seedlings some are promising. One, a seedling of Bederwood, which is earlier, better quality, higher color and just as productive. Another very fine seedling of Haverland, a staminate, good quality, large size and more productive than the mother plant. I have a number of late varieties that are good shippers, productive, large and fine in quality. Among all my varieties that I consider promising, I have only one pistillate, it is a very large berry, and the foliage is nearly black. I have named it "Mary E." My final work will end next year in fruiting several crosses on the Warfield. None of these varieties have been offered to the trade, as I want to know all the weak points as well as to know their good qualities. If there were no other motives, besides dollars and cents, in originating strawberries, it would require many dollars to pay the bill.

I have made some effort with seedling plums, and have about one hundred of the Americana and Domestic growing, but they have not yet fruited, and what the results will be time only will tell.

The great need of hardy winter apples for this country has been of more importance to me than all other fruits combined, and when this problem is solved, we may be forced to believe that to a large extent the future apples of this country must come from seeds of hardy parents. Originating apples goes a long ways in a man's lifetime, whether he is successful or not. This has been a part of my work, and I have now thirty varieties growing, which have been selected from many hundreds. I have intended to plant none but those I regarded as being hardy and of good foliage, but there were a few that proved different. Only a few of my seedlings have yet fruited. No. 1 fruited first. It is a large sub-acid September apple of good quality, and is now proving quite productive. Nos. 2 and 4 have fruited, but so far have not been productive. No. 3 is a late September apple of fine eating qualities, and is a very hardy tree, and is improving in productiveness, and may prove of some value. No. 6 is one of the hardiest trees upon my grounds, but the fruit is small, and I only grow it for a stock for top-grafting. In all respects it has proven a fine stock, and its great value is in rooting readily from the scion. Young trees of it in 1899 were not damaged in the least. No. 10 is a very hardy tree with good foliage and is more vigorous than the Duchess. It bore its first crop the past season. The apple

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is of large size and good quality; so far it seems to be a winter apple, but just how long it will keep, I am not able to say, or how productive it may prove to be.

It seems to be a very promising apple, and its name will be "Ivins' Pippin." No. 20 is the best fall apple I ever ate, not excepting the Rambeau. It is medium in size, is a dull red color, and the tree comes into bearing very early. The tree has blighted some, and the past two seasons the foliage was damaged by rust. What the outcome of this apple will be is yet to be seen. No. 12 is a winter apple, a hardy tree, and a very vigorous grower. It will be a year or two before this apple can be exhibited. The original tree met with an accident, and my young trees have not fruited. I have looked upon this variety as being one of the best, and I have many trees of them in the orchard.

Now what can be said of other seedlings which I have found in other parts of the state, I have given them a fair test upon my grounds. The Adamson apple is about thirty years old, and is supposed to be a seedling. It is a very large, beautiful, yellow apple and will keep until February. It has borne many heavy crops, and the tree is in good condition. The foliage is very thick and firm, nearly round, and almost an indigo blue in color. For a late fall apple, the Rankin exceeds every variety I have seen. It is a large yellow apple of good quality, and is as hardy as the Duchess. For four years I have seen the tree bending to the ground with its loads of fruit. Mr. Rankin's word is as good as any man's and he will verify this statement. The tree comes into bearing very young, and when this apple becomes generally known it will be largely planted as a marketable apple. Every year since I have planted the Arctic apple, I am better pleased with it; many of the trees bloomed last spring, but the heavy rains caught them, the same as other varieties, and no fruit set.

I have planted of this variety nearly three hundred trees, and they are the finest trees on my place, and in my judgment I believe I will never regret it. Deickmann seedling No. 1 is a grand September apple, of large size and fine quality. It is a seedling of the Duchess, and in tree is just as hardy. Its mammoth growth and enormous size of foliage surpasses every variety I have seen, and in digging my trees last fall I found one-third or a half of them had rooted at the scion. About fifteen other seedlings of Mr. Deickmann's I am growing, and many of them are hardy. Four years ago I sent to Lone Tree, Iowa, and procured a few scions of what is known as the Hinkley apple, and top-grafted several small trees. This year they fruited, and I was so well pleased with them that I went one hundred and fifty miles to see and know all I could about them. The original tree was about sixty years old when it was damaged by fire, and died four years ago. But few trees of this apple have ever been propagated, and the oldest now living is about forty-seven years old, and is owned by Mr. Hinkley who has a number of trees from ten to fifteen years old. Very few varieties of winter apples have a better record than this apple. It is of good size, good color, fine quality and is a long keeper. The good people of that vicinity told me "it would keep until June." I see no reason why this apple should not be grown in the north. I would rather chance one tree of this variety in a test winter than all the Longfields I am growing. I procured all the scions that

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could be had, and shall push its propagation. These varieties mentioned do not drop their fruit prematurely as many other varieties do.

Our grape list is fair to good, yet it seems to me that the ideal grape for the north has not been originated. We want a very early grape of good quality, very hardy and productive. With such a grape as this the planter could readily dispose of his crop before eastern grapes were shipped in. In view of our situation I have selected seeds from four or five of our best varieties to the number of 1,200, and planted them last fall. Four or five years will be required before I will know whether I will have a better grape than we now have.

If we ever expect this to be a fruit-growing country, we have a work to do, and this work is for all of us. We have many disadvantages to face, but with a head full of perseverance the obstacles that now confront us can largely be overcome, and trees will bloom and fruit, where they never have before.

TREASURER'S REPORT.

RECEIPTS.

December 17, 1902, from Elmer Reeves, account State appropriation	$ 100.00
December 17, 1902, from C. H. True, membership fees, etc	57.45
January 9, 1903, draft from Elmer Reeves, balance State association	100.00
Total	$257.45

DISBURSEMENTS.

December 18, 1902, paid G. H. Purdy, delegate expenses	$ 5.84
December 18, 1902, paid C. H. True, delegate expenses	9.15
December 18, 1902, paid E. M. Reeves, delegate expenses	5.92
December 18, 1902, paid G. A. Ivins, delegate expenses	6.85
December 18, 1902, paid C. A. Marshall, delegate expenses	7.70
December 18, 1902, paid Wesley Greene, delegate expenses	6.50
December 18, 1902, paid C. H. True on Secretary's salary	25.00
December 19, 1902, paid W. H. Guilford, expenses as delegate	12.64
December 18, 1902, paid A. J. Phillips, expenses as delegate	10.00
December 18, 1902, paid J. A. Ferris, for premiums	.50
December 18, 1902, paid W. E. Gaylord for premiums	2.00
December 18, 1902, paid A. W. Hatfield, delegate expenses	2.25
December 18, 1902, paid W. A. Burnap, delegate expenses	1.90
December 18, 1902, paid Christian Church, Nora Springs, use of church	15.00
December 18, 1902, paid Vienna Gaylord, use piano and expenses	7.00
December 18, 1902, paid W. E. Gaylord, for freight, etc., paid	3.00
December 24, 1902, paid C. H. True, balance Secretary's salary	25.00
January 10, 1903, paid G. A. Ivins, for premiums	4.00

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January 10, 1903, paid C. H. True, for premiums	$ 10.35
January 10, 1903, paid H. G. Patton, for premiums	3.00
January 10, 1903, paid Edson Gaylord, for premiums	9.50
January 10, 1903, paid J. B. Mitchell, for premiums	17.00
Total amount paid out	$ 190.10
Totel amount received	257.45
Balance on hand December 17, 1903	$ 67.35

C. A. MARSHALL,
Treasurer.

REPORT OF DELEGATE TO THE MINNESOTA STATE HORTICULTURAL SOCIETY.

BY J. B. MITCHELL, CRESCO.

By the courtesy of President Reeves I had the pleasure and honor to attend the Thirty-seventh annual meeting of the Minnesota State Horticultural Society at Minneapolis, December 1st to 4th, as delegate from this society.

The meeting was held in the audience room of the First Unitarian church. The fruit exhibited was in the lecture room in the basement, which is large and well lighted. More than one thousand plates of apples, mostly Minnesota grown, and a good showing of grapes and other fruit in the exhibit were good, well displayed and showed to advantage.

Northern Iowa will have to look well to her laurels in competition with Minnesota apple growers if she will keep to the front.

I regret not being at the first day's meeting.

Wednesday's morning session was called to order promptly at 9:00 o'clock by the president, Clarence Wedge, of Albert Lea. The early morning hours were taken up by reading addresses by President Wedge, in which he recommended steps be taken to provide a permanent home for the society.

The annual reports of the executive board, Wyman Elliott, Minneapolis, chairman; A. W. Latham, Minneapolis, secretary; A. B. Lyman, treasurer, Excelsior; and several reports of vice presidents, of which there is one from each of the nine congressional districts.

Frank Yahnke of Winona, in his report recommended several of the Russian apples. A. H. Reed, Glencoe, reports the largest apple crop ever grown there. R. A. Wright, Excelsior, says Charlamoff and Wealthy blighted badly with him; apple crop generally good. W. L. Taylor, Howard Lake, says apple crop good. Northwestern Greening was a heavy crop. D.T. Wheaton, Morris, reports the past season was very favorable for apples but some blight, a good crop of apples; raspberries and gooseberries poor. DeWain Cook, Jefferson, says apple trees on low land are doing well, Antonovka bore a heavy crop, Northwestern Greening bore well top-worked. A. B. Lyman, Excelsior, does not like Martha crab, says it is handsome in bloom but does not fruit.

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Prof. S. B. Green, of the State Agricultural College, presided at the afternoon session, as President Wedge was called home by a telegram stating that Mrs. Wedge had died suddenly in New York City, where she had been ill, but not considered dangerously so.

The afternoon session opened by H. H. S. Rowell, Minneapolis, reading a paper on "Minnesota as an Apple State." He said, "there are 1,000 plates of apples on exhibition at this meeting; the society has grown to 1,430 members by this time; the late P. M. Gideon has fruited 100 seedling apple trees; Minnesota has 2,000,000 apple trees in orchard; commercial apple growing is a success; apple culture in Minnesota is more sure than orange growing in Florida or California."

At 3 o'clock the Women's Auxiliary held a joint session with the horticultural society. President Miss Emma V. White, Minneapolis, read an address and ably presided over the meeting. Some of the topics treated were "Our Cousins, the Trees," "Peonies," "Protection of Song Birds." After the paper, "The Protection of Song Birds," had been read by Mrs. J. B. Hudson of Lake City, a resolution was passed to present the subject of the paper to the attention of the school teachers at the next meeting of the Minnesota Educational Society.

In discussing this paper A. J. Phillips, West Salem, Wis., put in a strong plea for the birds; he struck the keynote when he said "The Chicago car barn murderers are of the class of boys who kill innocent birds."

Thursday's morning session was mostly taken up with reading papers on evergreens, and reports of communities. White pine was generally considered the best adapted to the northern part of the State. It was contended by some that it would not succeed in the southern part. O. C. Gregg, of Lynel, said it was all right with protection. He preferred Golden willows for wind-break. Red cedar was generally claimed to be the best evergreen for southwestern Minnesota.

Thursday afternoon an hour memorial service was held in memory of members of the society who had died within the year, to wit: E. H. S. Dart, James T. Grimes, and W. W. Pendergast, and of Mrs. Clarence Wedge, in which many sympathetic testimonials were brought out.

The election of officers resulted in the re-election of President Wedge, Secretary Latham, Treasurer Lyman and nearly all the other officers. The balance of the afternoon was occupied in joint session with the Minnesota State Forestry Association.

Friday's morning session was taken up with reports of committees and awards of premiums and papers on nursery topics in general. The afternoon and closing session was devoted to the general subject, "Orcharding," which was well handled and interesting and was listened to by the largest audience of the meeting, the seating capacity of the audience room being nearly filled.

Though the society was conservative on the Russian apples there were quite a number who commended several sorts of them, they were also in evidence at the fruit display.

C. C. Dyke, of White Bear, who has about one thousand trees in orchard, says that Hibernal is the best stock for top-working and blights less than Virginia crab; he also said Patten's Greening was the money-making tree for him. Several others expressed the same opinion and Mr. Patten was

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complimented for having originated and disseminated the apple; whatever is said of it or its keeping quality pro or con, it seems that the Patten Greening is in Minnesota to stay.

It is hardly necessary for me to tell you that the horticulturists of Minnesota are an enthusiastic, energetic people; the progress they have made in apple culture since the organization of their society thirty-seven years ago and the growth of it to nearly fifteen hundred members, the largest like society on the western continent, and this in a climate formerly considered too rigorous for the attempt to grow fruit, fully attest this fact.

The many gray beards and white heads in this society indicate the early pioneers in horticulture who are still zealous in their chosen work to provide fruit for the home and to make the "North Star State" one of the foremost apple growing states in the union. It has already gained national notoriety in the production of valuable seedling apples.

At the American Pomological Society, held in Boston, September 12, 1903, Minnesota was awarded the "Wilder" gold medal for the best collection of new seedling apples. This collection, consisting of 109 plates, was again on exhibition at the state meeting just closed.

In their offer this year of premiums for seedling apples the society included the north third of Iowa, the west half of Wisconsin and North and South Dakota. The entries in this class comprise twenty-five early and seventy-five late winter sorts.

There were one hundred and twenty-six entries of seedling apples besides one of twenty-eight plates by E. T. Perkins, Red Wing, which were a partial duplicate of the one hundred and nine plate seedlings, but were picked later.

Total number of seedlings on tables.....	263
Total number of plates of all apples on tables	1,200

There are thirty entries to date for the $1,000 premium for the "Ideal" seedling apple, but the looked for product has not yet materialized. When it will "deponent saith not."

Delegates and visitors from the other states were: C. G. Patten and E. M. Sherman, Charles City, and A. F. Collman, Corning, Iowa; Prof. N. E. Hansen, Brookings, S. D.; J. P. Bentz, president South Dakota Horticultural Society, and A. E. Norby, Madison, S. D.; Rev. C. S. Harrison, York, Neb.; A. J. Phillips, West Salem, G. J. Kellogg, Lake Mills, Oliver Gibbs, Prescott, and W. S. Higbee, Washburn, Wisconsin.

The meeting was well attended and interesting to the end; the program was well kept up to the time by the expert management of President Green, in pruning the discussion.

It is worthy of remark that this progressive society has many young horticulturists to continue the noble work so well begun by the honored departed and those who sooner or later must lay down their burden.

Your delegate has many kindly feelings for and returns thanks to this society for their friendly greetings, courtesies and hospitality.

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REPORT OF DELEGATE TO NORTHWESTERN SOCIETY.

BY JOHN C. FERRIS, HAMPTON.

Mr. President and Gentlemen of the Northeastern Iowa Horticultural Society: Your delegate appointed to represent you in our sister society has performed that duty with much pleasure to himself and regrets his inability to convey to you the educational value of the meeting at Alta, and the literary excellence of the papers read and lectures given. Arriving during the afternoon of the first day, I found the genial Kinne in the chair supported by his able secretary, Hon. W. B. Chapman. Mr. L. H. Felter was reading a paper tending to show that we had rejected old varieties of value. He cited instances of healthy old Genitons and others in proof of his contention. Mr. L. A. Clemmons, of Storm Lake, followed with "Management of Apple Orchards." The value of his paper consisted in its brief, clear, pointed and instructive details. As the paper will appear in our annual volume its discussion here is unnecessary. Yet your delegate begs leave to differ as to the recommendation of apple trees with stems only eighteen inches. A higher average is desirable and the pruner must be governed by the habit of the tree of course.

The president's annual address was able and instructive. In the evening, Dr. Storms, President of the State Agricultural College, at Ames, entertained the society and citizens of Alta with his lecture, "Asking God Questions." Aside from the excellence in other lines of thought the lecture and the title were suggestive of our experimental work. No one can give adequate expression to the delight of the eloquence, the grace of delivery, and beauty of language of this magnificent man.

Wednesday morning the subject of grape growing was discussed, President Wragg of the State society taking a prominent part. Conclusions as to varieties seemed to settle upon Concord, Worden and Moore's Early as the most profitable for northern planting.

"Pears in the Northwest" was the title of a paper by Reverend Pelmulder.

Ben Shontz gave such a glowing description of the profits of fruit growing in Idaho, that there was danger of a stampede in that direction without waiting for the closing exercises.

Wednesday afternoon was given to a discussion of flowers, and the ladies of Alta gave many valuable suggestions in papers read which will grace the pages of our annual report.

Wednesday evening the society was royally entertained as the guests of the citizens of Alta. A literary and musical program seldom surpassed, delighted all auditors. A band from the rural districts composed of farmers' boys surprised us with the excellence of their performance, while Larson's mixed orchestra gave charming music between acts. We had excellent singing, and readings of such merit that it would require a discussion of the entire program to do justice to all. The daughter of President Kinne displayed wonderful histrionic talent in the character of the negro mammy. The drill by the school children was a perfect close of a most enjoyable evening.

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Thursday morning the old officers were re-elected, except that G. B. Healy of Sioux City was elected vice president. He will doubtless be the next president of the society, since the State society has captured their many times re-elected P. F. Kinne to preside at headquarters. After election we had an experience meeting.

W. F. Steigerwalt led in a strawberry discussion and received many endorsements. A. W. Hatfield discussed plums, and H. N. Antisdel new fruits. Their excellent reports will of course be read with interest in our volume of transactions.

The display of fruit was fine. Mr. Antisdel captured the largest number of premiums, but Mr. Clemons and others had fine displays of apples.

The closing session was made interesting and instructive by two young professors who represent horticulture at the State College. Prof. E. E. Little very clearly and ably discussed cherries, while Professor Erwin on "Orchard Problems" displayed much ability.

As a teacher the pleasure of the members and the educational value of the session was much enhanced by the presence of President W. J. Wragg and Secretary Wesley Greene, of the State society. Both are entertaining instructors along different lines. Perhaps the most pleasing paper read was that of vice president elect G. B. Healy, of Sioux City, near the close of the session, entitled "Horticulture as an Avocation." Mr. Healy will prove a valuable acquisition to Iowa horticulture.

The thanks returned by your delegate for the many courtesies extended to him were sincere, and they are here cordially repeated.

MUSHROOMS.

BY T. I. GIFFORD, DECORAH.

In summer we find in the gardens, on the lawns, growing about the roots of trees, and even growing on some of them, those ugly, good-for-nothing toadstools, and I have known them to spring up in winter among the house plants. What shall be done with those disagreeable growths that many associate with lizards, snakes and toads? My answer is study them, learn to know them whenever and wherever you see them, admire them, eat them, and like them. Eat them? Eat toadstools? I call them toadstools because they are best known by that name, but they are not toadstools, they are mushrooms, and I wish to mention four common errors with reference to them.

First. Many suppose that the poisonous growths about us are almost numberless, and among them are one or two edible species called mushrooms. This is reversed. There are one or two poisonous growths, and the rest are mostly good to eat. I have eaten between sixty and eighty different species. I can recall, without having kept a record, more than ten which I have seen growing within the city limits of Decorah. For a year and a half I have been in the groves and through the fields in this vicinity. I was camping nearly a week in Howard county last summer, and for a day

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or two near Postville, and I have not found a poisonous toadstool during this time. I commenced studying them five years ago, and I have not seen any poisonous ones except at three different times, and if we accept a statement made by a New York mushroom eater, in whom Charles Peck had sufficient confidence to record his experience in the State reports, I have seen them only twice, for he says he has eaten the Fly Amineta with no evil results. V. K. Chestnut describes in a bulletin from Washington thirty common poisonous plants; of these two are fungi, the others flowering plants. Taking this as a ratio, two and twenty-eight, if you eat every flowering plant we find, and I the mushroom, you will be fourteen times as liable to get poisoned as I; and, if we accept the statement in the New York reports mentioned above, the ratio will be one to twenty-eight. Poisonous mushrooms are rare.

Second. Another common mistake is that mushrooms are good to eat at certain stages and then become poisonous. I have eaten them of all ages from the time they first started to grow until they have turned dark with old age. With many kinds, age makes no more difference than it does with hogs. Some kinds, the Beef-tongue for example, become too tough to be eaten. Rotten vegetables are not fit for food and decaying mushrooms are no better. Wormy fruit and wormy mushrooms should not be eaten; but if they were poisonous, there are many now living who would have died long ago.

Third. It has been said that they are poison to some and not to others. They say "What is one man's meat is another man's poison." This assertion is false. You would have no fear of allowing any man to eat at your table wheat bread, potatoes and beef; and I have no more fear of my friends being poisoned with eighty different kinds of mushrooms that I have learned to know. I have no doubt that a full meal of pork would kill a man just recovering from typhoid fever, and I presume that a hearty meal of some kinds of mushrooms would do the same, but this is not because they are poisonous.

Fourth. Many suppose that there is a general rule to distinguish toadstools from mushrooms. No such rule can be given, and it is as unreasonable to ask for one, as it is to ask for a rule by which the whole vegetable kingdom can be divided into wholesome and poisonous plants. One kind does not look any more like another than wheat looks like oats, and may have no more resemblance than wheat and pumpkins. You do not think of poison ivy and tell me that I must not touch any plant whose leaves are three parted, but many handle and eat all others. Such a rule would be dangerous and so are the rules given to "tell mushrooms." We should be able to distinguish those we eat as readily as we do corn from a hundred other plants. The best rule known to distinguish them was given by Butler Rider of Pike, N. Y. He says, "If you find one you do not know with a toad sitting on it, call it a toadstool, but if the toad is not there call it a mushroom of an unknown variety."

Let us go for an imaginary walk in summer looking for mushrooms. On Broadway, close to some old maple roots, we see from fifty to a hundred about as large as my thumb standing like little umbrellas half open and so close together that they touch. The smaller ones are white beneath, the larger ones dark, and the top of the oldest have turned to black ink and

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dropped to the ground. They grow all summer during wet weather, and are plentiful in different parts of the city. We call them the ink mushrooms, and have no fear in gathering them, because there is nothing poisonous that looks like them. They are good fried and eaten with bread and potatoes.

We next come to the grove in the Updegraff addition. Standing some distance from any other mushroom, we find one a foot or more tall, whose top is somewhat globular and about as large as my fist. As this ball expands the ball breaks loose from the stem, leaving a ring. It soon looks so much like a parasol that it is called the Parasol mushroom. Sometimes we may see them a half a mile away, after haying and harvesting, growing on the meadows or in the stubble. They have patches of brownish color on the upper side, which we will remove, leaving the pure white before we roll them in flour and fry. After we have learned to know them, it will be easy to distinguish the smooth Lepiota which resembles them closely in structure, but differs by being much smaller, very white and smooth. They grow in patches among the stubble and in the potato field.

Here are some more fastened by their edges growing like shelves very close to each other on an oak stump. On the under side they look yellow like sulphur, and are called the sulphur mushroom. We will take only those that are soft clear through. They are good fried or made into soup.

We see other hard toadstool growths on the stumps, grayish above and white beneath. These will do for drawing pictures on their white surface and make good parlor ornaments. They are not poisonous, but I think you will not find anything about them that would be better to eat than the chips would be from the tree or stump on which they are growing.

In fourth ward we see some large pure white ones growing on the trees so conspicuous that we can see them two or three blocks away. Examining them closely we notice that their stems do not grow exactly in the center. They are called the elm mushroom, but grow readily on the box-elder. I find them quite good.

You are liable to find four kinds of puffballs. When they are old they burst open and the black stuff looks like smoke. Eat them only when they are white. They do not become poisonous but lose their flavor as soon as they change their color. One kind less than an inch in diameter, clustered on old wood, sometimes nearly covers one side of a stump. Another globular one grows in the grass and is larger than a hen's egg, still another is five or six inches in diameter, decreasing in size towards the ground. But the largest I ever saw was brought in from the country about twelve years ago to a church fair. It was as large as a good-sized washtub and is called the gigantic puffball. If they had realized that it was good to eat and fried it, there would have been a good slice for each of them.

Late in the fall on Baker's, near the cemetery, growing on and about the old stumps was a reddish brown mushroom called Cartinarius. I believe there was a wagon load growing on two acres at one time. You may know them by finding some small ones which have a lot of fine threads running from the cap to the stem. On the other ones these have disappeared.

There is another mushroom growing on the lawns resembling the cortinarius in color, called the fairy ring. They grow in a quarter, half or complete circle several feet across as though they had sprung up where the fairies have been dancing.

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Mushrooms are cooked in the various ways in which we cook meat. Whenever they are too plentiful to eat fresh, they may be canned the same as corn and will be as fresh in winter as when first picked. Some species will dry and afterwards become as fresh as ever by soaking in water. I have not tried this with any except the Pleurotus.

As for growing mushrooms, there is no field in which the possibilities are greater than this. No attempt has been made to cultivate more than one species in a hundred. It may be that the value of the potato, oat, and corn fields will be increased tenfold without decreasing the quantity of grain or potatoes if we learn to know as much about them as we know about other plants.

If there is any one who wishes to know about the mushrooms I have analyzed, I shall be glad to give him any information I can, and when he becomes interested in them, he will seldom see a detestable toadstool, but will find instead the most beautiful mushrooms.

The vernal amineta, always mentioned as poisonous, grows from a sort of cup from the ground and has a ring on the stem. We should not depend on a brief description to know them, but should take a thorough scientific description or have them pointed out by one who knows them. All aminetas grow from the cup and have a ring on the stem and I have eaten some species and find them very good.

As to the frequent reports in the newspapers of poisoning it is difficult to get reliable information. If a person should eat too much mutton and throw it up, the doctor will say what you have left in your stomach will not harm you; but if one overeats on mushroons, he will give an emetic, work the stomach pump, the story will soon go that the family is poisoned, the newspaper reporter will run in and give a flashy report of the sad case, and you may consider it fortunate if there are none frightened to death who have not eaten the mushrooms. The doctors are brought up with the same old superstitious dread of toadstools as other people and it is made no more a part of a medical course than it is a course of law, dentistry or the ministry. I have never met a physician that claims to know anything about mushrooms. When the potato bug first made its appearance, there were many cases of poisoning reported in the newspapers. They were said to be so poisonous that the vapor from throwing boiling water on them had caused deaths. I have known of six persons throwing up mushrooms, and I think I know the cause in each instance. Four of the six were from eating the smooth lepiota. A description of one will be sufficient. A large mess had been cooked and eaten, but still they tasted good. Some more were cooked and they ate until they cared for no more The stomach was overloaded and vomiting followed. In all six cases mentioned we knew what we were eating. There was no doctor, no emetic, no stomach pump, no deaths, and no one gained a reputation for skill in saving us from a horrible death for mistaking toadstools for mushrooms.

I believe that there is not one case in fifty of the newspaper reports which is a real case of poisoning. They should be classed with the newspaper kissing-bug stories.

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PRESIDENT'S ADDRESS.

BY ELMER M. REEVES, WAVERLY.

The past year has brought its varied experiences to the fruit growers and about the average amount of encouragement and profit. To the thoughtful man it has had its lessons of value if he but heed them. It has shown the need of more care in all the details of the work and especially in some lines that are not always considered necessary.

Cultivation should be timely and thorough, and its results are almost certain. Cultivation should be followed during the normal season of growth, and then some plan of soil protection carried out in our orchards and small fruits. Often a covering of weeds of late growth is the best that can be supplied. Untimely cultivation endangers the life of our trees as experience has shown, but in this as in many other things, we are apt to forget well established principles in the search for new methods.

Spraying is now recommended among fruit growers as necessary if best results are desired, and my experience indicates that the easier method of dust spraying is the most effective, and the only one that is at all practical for the busy farmer or fruit grower.

The study of adaptation of varieties to particular soils is important. The reports of growers on a new variety of raspberry or other fruit often show widely different results and that would indicate that soil has much to do with the success of most varieties, while some of the varieties that are best known and most valuable are less particular as to soil and difference in care.

Bee keeping has not received the attention among horticulturists that its importance deserves. While I do not believe that bees are a necessity in the proper pollination of our orchards, they aid in that work and gather a crop of nectar as it is produced daily and store it for future use. There are but few fruit growers on farms who might not keep a few stands of bees and with little work and expense supply their tables with one of the most valuable and healthful products.

Planting of trees, shrubs and herbaceous roots for ornamental purposes is gaining in favor as our country develops, but many places are bare of such, and their owners ignorant of what may be successfully planted, its care or the beauty of the many hardy plants now readily obtained. The peony, gladiolus, lily, iris, clematis, phlox, honeysuckle, hydrangea, syringa, and the many blooming roses are easy of culture and give such a varied and profuse bloom throughout the summer that their planting should become general. Tree peddlers have an opportunity in the way of disseminating these plants and informing people as to their culture that cannot be overlooked, and it is to be regretted that so many of the fraternity are themselves so poorly informed, and through ignorance and sometimes with a purpose to deceive give incorrect information to customers and by this as well as prices out of reach of the average purse, prevent the more general planting of these beauties.

Last year our vice president, Mr. Guilford, suggested that a circular letter be sent out asking that all join in the search for new fruits, and the bringing out of old sorts that are not receiving proper attention. A com-

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mittee was appointed consisting of four members who were to especially look after this matter, and it is hoped that they have something definite to report. A number of samples of fruits have been received by the president during the past year, showing the interest in this matter, and a large number of trees have been looked up. Many of the supposed seedlings have proved to be old and well-known sorts, and the long-keeping apple of desirable quality in tree and fruit is yet to be found. However, a continued campaign in this line can not help but stimulate the planting of seeds and the originating of a class of apples, pears, cherries and other fruits, possibly including the peach, that will be adapted to our part of the country.

It is my belief that a system of line-breeding from the best of the fruits we now have will bring the desired result. In support of this theory I might point to the method of close line-breeding followed to bring our domestic animals to the high degree of perfection they have attained, and also to the advance shown in many of the seedlings of Fameuse and other apples in the vigor of tree and better leaf, giving health and hardiness during trying times. I feel certain that in Fameuse, Wealthy, Malinda, Ben Davis and perhaps a few other good varieties we have the foundation for future orchards, such as Iowa has not known.

Measures are to be presented to our State legislature this winter looking to the protection of trees and the establishment of township and county parks and reserves where desired and all true lovers of nature should use their influence for the passage of such a bill.

Telephone companies often destroy or mutilate trees while the owner thinks himself helpless to save his property. Such is not the case, and no tree can be cut or pruned without the owner's consent.

A bill for a *pure food* law is already framed and will be urged for passage this winter. We should all do our utmost to secure this, and not allow Iowa to longer serve as the dumping ground of all dishonest products. By tests of state chemists samples of so-called pure strained honey were found to be 90 per cent glucose. Tomato catsup having not a trace of tomato, and coffee consisting of clay. Every article offered for sale should have a standard of purity or be labeled to show of what it consists. Let us work to this end.

While I do not know of any deaths among our members some have suffered in the loss of members of their families. With these let us sympathize, and also remember that we are all a little further on life's journey and some of our members are now so far advanced that they are unable to attend. Words of good will have been spoken for them, but a word of remembrance to them will no doubt be gratefully received.

The chair appointed the following committee on President's address:

J. B. Mitchell, G. A. Ivins and C. H. True.

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THURSDAY MORNING SESSION.

Meeting called to order by President Reeves, who announced the following committees:

On Treasurer's Report: Messrs. C. G. Patten, W. A. Burnap and Isaac Johnson.

On Secretary's Report: G. A. Ivins, Isaac Johnson and E. A. Bentz.

On Award of Premiums: Prof. E. E. Little.

On Final Resolutions: C. G. Patten and W. A. Burnap.

Mr. True read his report as director of the Fourth District.

REPORT OF DIRECTOR OF FOURTH DISTRICT.

BY C. H. TRUE, EDGEWOOD.

Generally speaking the yield of all kinds of fruit throughout the Fourth District proved to be more uneven and irregular than for many seasons past. The late frost and sleet storm at a period when the fruit buds were susceptible to the greatest injury was no doubt the principle cause of so great a failure in productiveness, especially so far as concerns the cherry and plum. The amount of damage done was determined by the locality whether protection was afforded or otherwise, and also by the period of blooming; for example the Miner plum being one of the latest sort escaped serious injury and bore a very satisfactory crop, and strange as it may seem, the Milton plum though the very earliest held its blossom back very late and also bore well. Gooseberries and currants suffered in a great measure and very little fruit in that line was harvested.

Apple buds upon close inspection showed no apparent injury, and many varieties blossomed abundantly, but no sooner did the fruit begin to form than appeared the scab and blight causing the falling of the fruit which continued until nearly all was off the trees long before they were of a size suitable for use. Of course these conditions did not obtain in all localities alike, but such was the general rule. Scarcely has a season passed when apple twig blight was more prevalent and where greater injury was sustained from such cause. Had it not been for the liberal yield of small fruit in some lines, the conditions of the past summer would have been very discouraging indeed. We credit the strawberry crop with 100 per cent at least and in some instances the yield was above that figure. In speaking of just a few of the newer sort we are indebted to Nic Ohmar for a few very large mealy berries of first quality. The plant though not very numerous are strong ones and quite free from disease. They are not productive enough for extensive planting. Dunlap produced quite a fair crop of large and fine flavored berries, smooth and rather even in size, but its foliage is so dense

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as to almost smother the fruit, and excluding the light so as to prevent the natural coloring of the fruit. With a single year's trial on clay or clay loam soils, it has not proven equal in productiveness with the Clyde, Bederwood or Warfield. Rough Rider is a very late, shy-bearing sort and a little inclined to rust.

The raspberry crop was smaller than for many years past. Many plantations have gradually weakened by disease and unfavorable seasons to the extent that many of them have become almost worthless. On low lands the past two seasons have been too wet for this plant, and leaf rust has prevailed.

Blackberries did their best in nearly all sections where they are grown, and were in good demand because of a shortage in the crop of raspberries. A comparatively new sort under the name of Merserau is claiming attention throughout the Central West, as well as in the East, and should it prove to merit what is claimed for it, will soon lead all others in hardiness, productiveness and quality.

Young vineyards where well cared for with strong exposures to the south or southeast, set a fair crop of fruit, but the extremely wet and cool summer was very unfavorable for the natural maturing and ripening of the fruit. After all, Moore's Early in nearly every instance ripened almost perfectly, was ready for the September fairs and brought five cents per pound in the market. Worden came about ten days later, selling on an average for about three cents per pound. Concord bore rather shyly and ripened less evenly than Worden. The season has proved favorable for wood growth and bud development, and a prospect for an average yield of most kinds of fruit for the year to follow may be reasonably hoped for.

MR. BURNAP: Where I am the Concord grape cannot be depended upon to ripen.

MR. GUILFORD: I have had very good success by mulching.

THE ADVISABILITY OF PLANTING COMMERCIAL ORCHARDS IN THE NORTH.

BY L. P. H. HIGHBY, ALBERT LEA, MINN.

We need not go back very far in the history of horticulture in the Northwest before we get to the time where a subject like this would receive scant consideration. People used to ask whether it would be advisable to try to grow a few crabs for home use or a few of the hardiest apples. As to growing apples for the market it has until our own day been narrowed down to the selling in exchange for duebills of a few bushels of crabs or apples wherever trees were over-bearing.

It is not until recently that the question has come squarely before us as to whether or not good level-headed men, who are able to judge of the chances correctly and who are not led on by enthusiasm alone, should plant

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orchards on a larger scale and in such a way as to depend more or less on the orchard for a living.

Now there can be no question as to the market for the apples we may be able to grow. The great prairie states to the north and west of us which are building up with such wonderful rapidity will want all we can grow for some time to come and it will readily be seen that we have the advantage of position in competition with other sections of the country. Then, too, it should be understood that our northern-grown apples are of higher quality than those grown to the south and west of us. A temperate climate with a reasonable amount of moisture is what produces quality in fruit. Now we do not boast of having a climate especially noted for being temperete; but nevertheless we have less of excessive heat and drought which is so much the rule south of us. Just as sure as Manitoba is today renowned for its splendid wheat, so shall in the future our section of the western plains be noted for its good juicy apples. As a rule any fruit or cereal will increase in quality as it approaches the northern limit of its zone.

During the past season Minnesota grown apples sold in the western part of Minnesota and in the Dakotas for fifty cents more a barrel than Michigan apples would bring. I am not quite sure that this should naturally be so; but it does occur to me that our home grown apples should bring at least double the price paid for those southern grown Ben Davis which we used to buy so largely on the strength of their appearance. The main question before us is this, "Can we with profit grow the apples, or are the climate conditions so as to make orcharding impracticable?" Now we must judge the future by the past and I maintain that it has been ably demonstrated that we can grow apples with a good profit. Numerous examples have been given from time to time of splendid results. In 1893 I helped a neighbor of mine at Albert Lea to plant a small Duchess orchard occupying only 119 square rods. For the last three years that orchard has brought its owner on the average $1.30 per square rod or at the rate of $208 per acre. What will it not bring by the time the trees are full grown?

Those who take a pessimistic view of the prospects name several reasons why orcharding should not pay in this northern location. Let us look at them. Some one will say that night frost in late spring will often manage to kill the blossoms. Well, what about it? Don't they have that same trouble all the way down to the gulf states? Or is it not a fact that in the season just passed fruit blossoms were killed to an alarming extent all over the west except northern Iowa and Minnesota? We were apparently the only ones who escaped and, by watching reports for the last five or six years, it has become a question to my mind whether we are worse off than the rest of the west in this respect.

Some one will say that our hard winters will kill trees back. So they will. Even Mr. Hale, of peach orchard fame, had to wire to New York for pruning saws a few years ago when his Georgia orchard was killed back to the stems; but he had a fine crop three years later.

Again it was argued that the trees will root-kill in severe winters when there is little snow on the ground, and here we meet somewhat serious agrement. Undoubtedly root-killing is more liable to take place with us than further south. However, by using care in selection of stock, by using plenty of mulching, especially where the orchard is exposed to the northwest

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wind, the danger can be practically overcome. In this connection I desire to give it as my opinion that a too steep north slope is not an ideal location for an orchard.

As to insects and fungus diseases we certainly are not any worse off than other sections, and have a little the better of it in comparison.

Of course we have seasons when, for some reason or other, the apple crop is more or less of a failure, but that can, as a good many will testify, be said of our corn crop too. And I, for my part, have yet to see the first year when orchards in our section failed to bear some fruit.

Some Iowa man said a few years ago that an orchard would yield on an average $1 per tree, or $100 per acre after reaching bearing age. Provided the orchard ordinary good care, I should consider this a very conservative estimate judged from my observations.

I firmly believe that Northern Iowa and Southern Minnesota are destined to grow many and good apples Within the next few years many commercial orchards will be planted. Those who are thinking of going into the business should study the subject diligently. There is nothing like starting right.

The highest and most ideal locations as to soil, slope and exposure are none too good. Only northern grown trees should be planted. The commercial orchard proper should contain but very few varieties. Topworking should not be undertaken unless it has been definitely proven that something is gained thereby, Only a short time ago I saw a man topwork Patten's Greening on other trees, I do not consider that necessary.

MR. BURNAP: What is your method of cultivation?

MR. HIGBY: As clean as possible.

MR. BURNAP: What about Northwestern Greening?

MR. HIGBY: It is a little slow coming into bearing and I think Patten's Greening is a more safe tree to plant in Minnesota.

MR. TRIGG: Will you name three varieties that you would plant?

MR. HIGBY: I will name two, Northwestern Greening and Patten's Greening.

MR. TRIGG: What would you choose for a third variety?

MR. HIGBY: Yahnke.

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CARE AND MARKETING OF SMALL FRUITS.

BY C. H. TRUE, EDGWOOD.

The question of varieties, location and soils, do not enter into the subject under consideration. It is presumably true that every grower of small fruits, has thoroughly considered these questions and governed himself accordingly. While the foregoing conditions are matters of much concern, yet the care of the small fruit plantation is preeminent among all others. And so I would say first of all, wherever you may be located, or whatever you may plant, be sure above all things that you do not undertake to cover more ground than you will be able to give the most thorough and complete cultivation. We all understand that the term cultivation is not confined simply to the stirring of the soil and in keeping it free from weeds and grasses, but also to the matter of pruning and that of directing the growth and form of the plant, according to its nature and habits.

Blood will tell, is a common adage among stock breeders and stock growers, but the care of the stock after all, is what will tell in the show ring, in the market and on the butchers' block. In the matter of fruit growing it is equally true that varieties will tell, but the attention that is given the plant in the way of cultivation and fertilization, pruning, etc., is of still greater importance. I need not go into extended details in attempting to instruct my brother fruit grower in the various modes of cultivation, since all of the best methods have been so frequently discussed and practiced. I will say, however, that clean cultivation by hand and by the use of our improved cultivators is the best treatment that can possibly be given to all our fruiting plants in order to obtain the best possible results. I will note this exception however in the treatment of blackberry and raspberry plants after the first or second year's growth—that where there is an abundance of mulching material and barnyard manure, the same may be applied very advantageously and be made to take the place of clean cultivation, at the same time reducing the amount of labor, and reducing also the number of succoring plants, caused by severing of the root in the process of cultivation. A saving of time is also gained by this means, since the mulch can be applied at any time between late fall and early spring time. I am not sure but what the manuring and mulching process were applied to the blackberry and raspberry has in my own experience proven more satisfactory and profitable than has the method of clean cultivation, but the work must be done in the most thorough manner. This method however can not be so well applied in the treatment of the strawberry and grape. The matter of protection may be properly considered under the subject of care of small fruit. And it is very essential that some sort of protection should be given to all fruiting plants and vines, unless possibly we except the black raspberry. There is an advantage gained by this means even in our mildest winters, for we have long since learned that severe cold is not the only condition that weakens and destroys the vitality of our fruiting plant. No doubt each one of us has noticed the increased vigor so apparent in the protected plant over the unprotected one close beside it, and especially is this

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true with the grape vine. Even though the winter may have been so mild as to cause no perceptible injury to root or branch, the protection has a tendency to greatly preserve its vitality and to start it out in earlier leafing and blooming, and possibly may effect the earlier maturing of its fruit. For the covering of the vine, especially where it has become large and unyielding a few pieces of sod, blocks of wood or stones, are convenient for holding the vine to the ground, finishing with a light covering of soil, the crown of the plant receiving a liberal supply. In covering strawberry plants one year ago, I found fresh stable manure from the horse stalls, containing a very liberal supply of straw, a most effectual mulch and fertilizer, but in its use we should heed the caution so often given, be careful not to put it on too liberally. And I will add further that where this kind of protection is given it will be necessary in early spring time to go over the beds and loosen up the mulching, and removing a portion of that which was too heavily applied.

We are now to consider a few points respecting the marketing of small fruit, a question more than equal in importance than to the growing of it, for the manner in which it is prepared for the market and its appearance before the dealer and customer determines very materially its value or the profit to be returned to the producer. To say anything on this subject, is simply to repeat what has many times been said and written. It is always desirable to dispose of each days pickings just as soon as possible, and as has oftimes been advised, seek first of all the near by market, not simply for the reason that the sooner the fruit can be disposed of the better will be its condition and appearance, but in part, in view of the great saving in the extra cost of shipping and rehandling. Be your own salesman as far as it is possible. Of course the large grower cannot be expected to do this, but by past experience he can soon acquaint himself with the best markets and with the most reliable dealers. There are times when the fruit must be held over for a single night, for the arrival of trains, or for want of time to get all of the days picking off in time for shipment of the same day. In such cases how can the fruit be best held until it can be forwarded? The extreme heat and heavy atmosphere which prevail during the harvest time of our small fruits render the conditions very unfavorable for its preservation, and it sometimes is very difficult to keep it well preserved even for a few hours, especially in times of frequent showers. All fruit should be perfectly dry when picked if possible, and yet providing it can be used the same day if not overripe it will make no material difference. Every fruit grower should be provided with some cool, dry and airy cellar, or outdoor shed which will be about the best place in which to store fresh fruit for a short time. To such a place the fruit should be removed as soon as possible after the crates have been filled, the boxes being removed from the crates and placed singly on shelves or on the bottom of cellar or storage room, so as to bring the fruit in contact with the air as much as possible. Local grocers have objected to the use of the common cold storage room for the holding over of fresh fruit, such as berries especially, except they can be immediately disposed of when taken out, as the sudden change from a very cool to a very warm atmosphere causes rapid decay.

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The past season I was induced to use a trial lot of wax lined paper berry boxes, but they did not prove as satisfactory as the ordinary wooden box in general use. They are too flexible and yielding, and less convenient for placing in and removing from the crates. The capacity of these boxes is a shade larger than the common wooden box.

APPLES IN WISCONSIN.

BY WILLIAM TOOLE, BARABOO.

When Wisconsin fruit-growers get together at meetings of the state or local horticultural societies, their leading thought is to improve present conditions. "Forward" is their motto, therefore difficulties and failures are considered and remedies are sought, consequently, a reading of the records of discussions might give outsiders the impression that raising apples in our state is well nigh a failure. Nevertheless, our orchards pay and we increase our plantings of young trees.

The time was when we thought that the northern part of our state was too far north for apples, but added years of experience seem to carry the boundry line farther north until we are surprised at our possibilities, just as our friends south of us have been surprised when they have seen our displays of fruit at the expositions at New Orleans, Chicago, Omaha and Buffalo.

We still seek for new varieties, especially an ideal winter kind, yet we grow more varieties than are profitable, from a commercial standpoint.

Our superintendent of fruit collection for apples to be placed in cold storage for the coming St. Louis exposition, sent to collectors the following list of varieties to be sought for: Avista, Ben Davis, Eureka, Fall Orange, Golden Russet, Grimes' Golden, Jonathan, Malinda, Mann, Minkler, Newell, Northwestern Greening, Patten's Greening, Pewaukee, Scott's Winter, Tallman Sweet, Walbridge, Wealthy, Willow Twig, Fameuse, McMahon, Perry Russet, Blue Pearmain, Windsor, Pipka, Seek-no-Further, Plumb's Cider and Switzer, all of which are grown in our State in sufficient quantity to make a showing from. To these may be added next summer and fall: Transparent, Tetofsky, Red Astrachan, Lowland Raspberry, Dodgeville, Haas, Duchess, Yellow Sweet, St. Lawrence, Anisim, Longfield, Gideon, Getman, Bell Pippin, Cross, Lub's Queen, Alexander, Wolf River, Wisconsin Russet, Red Russet, Kirkwood, Sweet Russet, Fameuse Sweet and others. While these all have desirable qualities, but few are looked on as money-makers. Transparent would pay for first early if it did not blight so badly. Lowland Raspberry will probably prove more profitable and is a better apple. Duchess of Oldenburg has been a money-maker, and some of the Russians of its type fit in with it. Of these

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we have a variety with the local name of Laxenian, which is as good a yielder and as hardy, a little later and a better quality. Plumb's Cider and Fall Orange are profitable, especially the former. Wealthy would probably receive more votes than any other kind. Anisim and Longfield are favorite market varieties with some, while others say they are too small to be profitable. McMahon and Newell have each many strong friends. The latter is probably our best all-around winter variety, although Northwestern shows up better in a barrel. Tallman Sweet is always in demand and bears fairly well. My experience with Seek-no-Further would place it among the profitable varieties. Fameuse has paid well, notwithstanding the drawback of scab.

In the early days our pioneer horticulturists, with a few favorable years, thought they could grow all the eastern varieties of apples, supposing that degrees of temperature controlled conditions of hardiness. In course of time they had adverse experiences, succeeded by experiments and theories. The discovery that our dryer climate called for different qualities, led some to theorize that a hardier stock would stop the blistering of the bark, called sun scald. Then it was found there was such a thing as lack of affinity of some varieties in union with certain stocks. Now varieties are found for stock with a broader range of affinity for union with other varieties, but general adoption of their use would necessitate all orchardists becoming nurserymen as well. And then it is found that the hardy stock may have tender roots and kill in the nursery before the stock's own roots are established, so we look for seeds from hardy varieties that the buyers may get young trees with live roots. The nurseryman says that his short-piece roots compel the scions to make their own roots, but sometimes the making is too slow.

A cover crop is advocated by some, in the nursery for winter protection of roots, and others who have tried it say that mice are protected more than the roots. At one time some of our leading horticulturists talked in favor of planting the seed where the trees were to be grown, claiming that such trees would have tap roots which would be their salvation, but the lecture by Professor Bailey taught us that pruning of roots or branches will not change the tendency of growth above or below, so we hear no more of that theory, and we have been led by the low-heading theory, and hybridizing with crabs, native and foreign. Russians excited great expectations, but gave us but little to tie to.

Seedlings have given us a larger percentage of promising varieties than any other source, and Minnesota has probably given us the best one, but our valuable Wisconsin varieties should have induced our State Horticultural Society to do more than it has done to encourage the establishment of better varieties. Minnesota deserves great praise for what she is doing in this line. To go into the history of the ups and downs of fruit growing in Wisconsin would take up too much time. Our climate is about like your own and we must have had about the same experience. Difference would mainly consist in soil and configuration. In our section we look for a well-drained clay soil and elevated location, sloping to the north or northeast, but there are some very fine orchards at the base of bluff ranges on the north side. Aside from taking advantage of slope a breaking of the force of western winds is the most which should be done in the way of shelter.

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Tree agents have been an important factor in the cause of orchard planting, and a great mistake has been made in our own state in running down this kind of pioneer work instead of elevating the calling. Our present knowledge of culture would not have been acquired if there had been no Wisconsin State Horticultural Society. Yet all that has been done and all we now know are but the foundation of Wisconsin horticulture in the future. Our failures have taught us valuable lessons; our successes have been encouraging. The pioneers of western horticulture are passing away, and it behooves those who yet remain to keep this society work in good shape, that the young men who follow may not be hindered by correcting our mistakes.

MR. BURNAP: How is Patten's Greening?

MR. TOOLE: I have not much experience.

MR. PATTEN: Are you interesting your young men in horticulture?

MR. TOOLE: We are in the short course school, but there are not as many young men interested as I would like to see.

PRESIDENT REEVES: The young men are home doing the work while the old men are attending the horticultural meetings, I presume.

ARE THE RUSSIAN APPLES AN IMPORTANT ACQUISITION?

BY J. B. MITCHELL, CRESCO.

If we construe this question to apply to the more congenial climate of the East and favored localities, my answer would be, they are not important, though a few of the earlier ones are desirable in much of the territory where apples are grown. Their early and good bearing qualities of handsome and fair quality of fruit commend them to the early market. If we construe it to apply to northern Iowa, and localities with like climate or a more vigorous one, there can be no doubt of the correctness of an affirmative reply.

That the trees are more hardy than the so called American sorts was fully demonstrated in the past history of apple tree culture in northern Iowa. Under present conditions of our climate their importance, perhaps is not so manifest, but I cannot bring myself to the belief that the order of things have so changed that we are not again to have a repetition of past disasterous winters.

Should the past repeat itself, these Russian trees will be important to supply us with apples while bridging over the chasm between the death of the American sorts in orchard and the growing of a new one. You may think me a pessimist, but we will leave that to the future. However this may be the Russian apples have a coexisting importance with the other kinds at the present time, in supplying apples for the home and for market which is worthy of consideration. I find a good market for them at home and

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have shipped them north and west to inland towns and they have given general satisfaction and at better prices than Duchess sold for.

In the season of 1902 I furnished Cresco dealers with early Russian apples for two weeks before the Duchess was on the market, and received one dollar per bushel for them. After Duchess came on the market at forty and fifty cents per bushel, I received seventy-five cents per bushel for my Russian apples. These apples have been derided but they have been an improtant factor in rebuilding the orchards of my county and adjoining territory, and have given zest and new life to apple culture where they have been planted in the Northwest, because they have withstood the climate better than other kind and are bearing good crops of fruit that delight the eye, and some of them the palate.

Many of them are of fairly good quality, notwithstanding the ridicule they have been subjected to. I have often had it remarked to me that this or that "of the Russian apples is the best apple I ever ate." Is not the best good enough.

For northern Iowa, the Russian apples are an "important acquisition."

ORCHARDING IN THE NORTHWEST, OUR HITS AND MISSES.

BY EDSON GAYLORD, NORA SPRINGS.

My first move proved to be my most serious mistake. One that has taken me the better part of my life to correct. After half a century of effort, I am sorry to say that I have only partially succeeded. There are four things in the makeup of an orchard site that are practically beyond human efforts to fully control; *climate*, *altitude*, *slopes and soil*. I have as many as five altitudes, and as many slopes and soils. As to climate we often are led to think that to number them correctly is beyond human skill. Many sites can be improved, some more, some less. Sites for individual trees even on a bad location, can often be selected that will stand as high as No. 2 or 3. Trees can often be set to receive the protection from the sun from eight A. M. to five P. M. In this case it matters little which way a tree may lean. In such cases only, would I follow the injunction so repeatedly given by our kind professors, to grow our trees with symmetrical heads. In conjunction with this erroneous advice comes the oft repeated admonition to set our trees leaning southwest, and down to an angle of 45 degrees. These three things are *three serious errors*, and are made more serious from the fact that it so often comes from our professors, as well as from those who lead in horticultural lore. This beautiful term, symmetrical, so often used East and South is alright there, but all wrong when applied to the Northwest. To say the least, it is surprisingly strange to find the ignorance that still prevails as to the extent of evil caused by the steady, uninterrupted rays of the sun for two hours and a half at a time, from eight A. M. until five P. M., not only on our apple trees but on our evergreens. Not only these but thousands of our native forest trees when set exposed to the sun and are allowed to lean from the sun at any time from near sunrise until sunset, are injured more or less. Some varieties are more susceptible to this injury than others. This injury is more serious on some locations than others. All things being equal any tree that is subject to sun killing that

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stands perpendicular will show a dead line invariably at half past one. In case any tree leans from the sun from any point of the compass, the injury will be seen on the side from which the tree leans. To illustrate, I recently met a number of students near a hickory tree, seven inches in diameter and ten feet to the first branches. This tree was leaning northwest, and was sun-killed from the ground to the first branches; the bark was all killed and off on this side, but the rest of the tree was perfectly sound. I called the students' attention to this tree, tried to have them tell me what had caused the injury, could get no reply but from one, who, when pressed for reasons, said he had no reason, except that it might be worms. On my way home I met another student nearly as tall as myself, near another sun injured tree. I asked him to tell me what he thought had injured the tree. After a thorough search for hidden causes, he replied, "I can give no reason for the injury." Here the question came back to me with double force, as horticulturists. "Where are we at?" This is not so much of a surprise when we look back "on the man with the hoe" but to find such stupidity, such glaring ignorance, still lurking not only among our students, but among many teachers, who occupy positions in our schools. This is where we horticulturists are at, and we might as well own up. "An honest confession is good for the soul." Have we done our best; if not, why not? The ignorance and stupidity that now exists among the masses is, or ought to be, alarming to all who are laboring for the advancement of our northwestern horticulture. If we ever hope to give fruit growing the honor it deserves, we must join hands and see to it that we do not neglect to accomplish some much needed reforms. First, we must educate the masses to eat more fruit. This can never be done by crowding on our markets so much third and fourth rate fruits. The time has been when we could do no better, but now we are called on to reform, which we can do if we make use of the many valuable lessons gained in the school of experience in the last half century. It has been well demonstrated both by the fruits now being on exhibition on these tables and in many places over the northwest, that with reasonable care we can grow apples nearly equal to the best grown in any climate. Add to this the fact that our markets will be our own home markets and not be forced to ship three or four thousand miles to foreign lands, but to do this, we must have, size, quality and keeping. We have these three requirements already to give us a start, providing that we who are working for the true interest of horticulture no longer sanction or in any way recommend the further propagation of apples of fourth and fifth rate quality. But to accomplish much needed reform, no horticulturist should be induced to further sanction the propagation of any fruits of lower grade than No. 3.

Half of my original site was on a sharp slope to the southwest and on the river bottom. Can grow 100 bushels of corn to the acre, of sorghum 160 gallons per acre. But after the most persistent efforts to grow apples there, I abandoned this part and got up on higher grounds, on slopes northwest, north, and northeast, the soil with less sand and more clay. Now I have three acres only in orchard, but have about 500 trees, nearly every tree top-grafted on extremely hardy stock, hardy roots, hardy stems, and hardy forks. Through this plan I have succeeded in fruiting 100 varieties of choice apples. Some of my best are Northwestern Greening, Malinda, Peerless,

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Grimes Golden, Jonathan, Utter's Red, Plumb's Cider, Wealthy, Ohio Sweet, Lady Sweet, St. Lawrence, Fall Queen, Red Charlamoff, Fall Orange and the Ohio Seek-no-Further. Besides these numerous other kinds, some that I have lost their names.

It may be of interest to many to learn some of those I deem among my poorer varieties. The Russians, Patten's Greening, Avista, Ben Davis, Roman Stem, Ethel, Hibernal and others. I missed it by being closed in on all sides by higher surroundings, thickly set with tall timber and by my evergreen hedge. I hit it when I let in the air from all sides but south and southwest. Missed it by setting too far apart north and south. Hit it by setting twice as thick north and south as east and west. Missed it in cultivating well and having the ground clean and bare in either winter or summer. Hit it by letting the ground go to grass, except about two feet about the base of each tree. Hit it by mounding the trees to protect from mice and winds in spring, fall and winter. Hit it when I found a tree heavily set with fruit to manure it. Missed it in trimming my trees over two feet high, and more especially when I let them lean northeast, or in short in any direction, except to the 1 o'clock mark in February. If there is a mathematical exactness in setting or growing a tree in the northwest it is in this particular more than in any other one thing.

To grow trees as trees should be grown in the northwest to make them self-protecting from the sun, as soon as set, cut off close to the body all branches making northeast and keep them off until the tree is bearing. After this there is no necessity of this special care. I missed it when I followed the advice to head in on the northeast side, to build up the sunny side. I found this added fuel to fire by sending out two shoots in place of the one cut off. By keeping all limbs off the northeast corner of a tree, I found the sap was forced to turn from its natural course northeast, and go over and build up the sun side, which soon makes a tree self-protecting. I deem this one of the most important points in orcharding in the northwest. If a tree is grown right from the start until it commences to bear it will need little after-care on this line. When I find an apple tree or many of our forest trees leaning either northeast, north or northwest, I know that if it has no protection from the steady direct rays of the sun it is a doomed tree, and its existence is only a question of time; modified more or less by its variety and its surroundings. I hold myself ready to show any one scores of forest and apple trees seriously injured, that are leaning not only northeast, but north and northwest as well. Just why our trees seemingly resent being grown to the sun (which they plainly show by their repeated and persistent efforts to grow from it) is as yet an unsolved problem. My reasons are these: The sunny side of a tree is more exposed to the steady rays of the sun both above and below the surface. The other side being more or less shaded has more moisture, the soil being less baked is more loose and cool, which gives the trees on the northeast side those conditions so much more congenial than those on the sun side. I have one other reason that I have gained mainly from personal observation in our forest. I am led to believe that each branch has its special corresponding root, and each principal root, has its own special branch to support, and that it will make persistent efforts to fill the place nature has designed, and that nothing but untiring efforts will change its course. I am strong in the belief that

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the shortest and most effectual way to make a tree grow self-protecting would be when setting to cut off all roots as well as branches on the northeast. To counteract the evil by the direct rays of the sun both summer and winter. I take special care to see that my trees are thoroughly protected either by persistent and oft repeated cultivation or by mulching. The latter I find by far the most practical. This brings us directly to the question of roots for our trees, which in reality is the most important problem that we as horticulturists in the northwest have before us today; a subject of the utmost importance that seldom has been thought of and much less referred to, especially by our tree propagaters or their agents. While the masses up to this hour are totally ignorant of the now too well known fact, viz., that most of our fruit trees are grown mainly on tender roots, and if set in the northwest are sooner or later doomed to a lingering and untimely death. It may be one year and it may be twenty, governed more or less by the amount of roots from the scion, and is whether they be from a hardy or tender scion. We know that a half-hardy scion can give us only half-hardy roots. That an extremely hardy root will endure double the exposures that one half hardy will, and yet many seemingly know little if any choice between a strong grown tree on tender roots and one a little less in size grown on extremely hardy roots. In short many choose the former, notwithstanding they are often propagated south of the Mason and Dixon line. Since 1885 I have set but very few trees except I have known them to be grown on hardy roots, with hard stems and heads. I have tested some two hundred varieties of choice grafted apples on this line since 1886, up to date not a variety shows injury except from blight, and this only on two or three varieties.

I hit it when I so fenced my orchard so as to keep my pigs either in or out. The pig is considered a lazy animal; far from it. He will upset, turn over, root out, and destroy more evil doers than any other animal, man scarcely accepted. In short he never tires, but is always on the hunt for the lurking places of our orchard enemies, he never fails to examine closely every nook and corner, the natural breeding places of evil insects. I hit it when I got turkeys to roam over my orchard daily. They rank next to the pig for destroying insects. I missed it in not keeping bees to pollenize my fruits, but hit it in growing so many varieties so mixed up all over my orchard. This and my near neighbors who kept bees, helped out as to the distribution of pollen. The pig and the turkey I find each important adjuncts in the orchard; the former being thoroughly omnivorous. I hit it when I mulched my trees soon after the ground was frozen or before there came a thaw. Hit it when I let my orchard run to blue grass. This prevented root-killing and lessened the chances of blight. Missed it when I put warm ashes around the base of frozen trees. Missed it when I put warm tar and lard mixed on the trees to protect from rabbits, bores and mice. Missed it when I wrapped over two hundred trees four years old (the best trees I ever had) with mineral tarred paper. After letting it remain eighteen months I found nearly every tree seriously injured. Less than half dozen survived, and these only for a short time. Missed it when letting trees grow in any direction but toward the sun at 1 o'clock. Hit it when I found my trees being injured by sun to tack a light board with fine nails to the injured side of the tree, not touching the ground. When nailed

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with two nails, one at top and the other near bottom, press the board off from the tree half an inch. One who has never tested this remedy for sun-killing will be surprised to see how soon a tree will heal over Thousands of trees are being revived by this simple treatment. I missed it when I failed to search for bores every two or three weeks through the summer. Missed it when I thought the round-headed bore only worked on tender or injured trees. Missed it when I thought the flat-headed borer first killed the bark on the trunks, and it was these and not the sun that gave us sun scald. Hit it when I learned that the flat-headed borers were very innocent when compared with the round-headed borers. Hit it when I refused to deal with strangers, or with irresponsible tree venders, or even with unreliable home nurserymen. Hit it when I trimmed in spring or fall. Missed it when I trimmed when the thermometer was 20 degrees below zero. Hit it when top-working to set all scions possible to and not from the sun. Missed it when I cut off most of the branches of bearing trees in one season. Missed it when in growing two kinds so near alike on the same tree, that I have to eat them to know them apart. Missed it when grafting for my neighbors who failed to keep the native branches and new shoots from overgrowing the grafts. Hit it when I kept a box-trap set, one in each orchard, baited with either sweet-apple or sweet-corn. I have followed this plan for thirty years in a bad place for rabbits, and never had a tree injured when the traps were kept in order. Hit it when I grew an early and a late kind on the same tree. Hit it when I looked less at the top and more to the roots to learn the causes of my failing trees. Missed it when I set apple trees either close on the south side of buildings, hedges, thickets, or even on the south side of fences. Hit it when I set on the shaded side. Missed it when I followed the old and misleading counsels we learned from our fathers in other climes, not only taught us many years ago, but repeated to us even in our advanced up-to-date horticultural papers. I hit it when I set my trees from three to seven inches deeper than grown in nursery, and in some soils as low as fourteen. Hit it when I learned the fact that it was the sun and not the southwest wind that so persistently forced our trees to the northeast. What convinced me of this fact was first by discovering that the trees in my own orchard most thoroughly protected from all southwest winds were badly leaning northeast. My further proof was found on finding eight other orchards thoroughly protected from the southwest by tall timber, all leaning the same, and these even worse than other orchards exposed to the southwest winds.

A LESSON IN POLLENATION.

BY C. G. PATTEN.

In the production of fruits the importance of perfect pollenation cannot be estimated too highly.

In the case of strawberries it is safer to rely on one late, and one earlier blooming staminate, than upon a single one to fertilize any pistilate variety, as one or the other of the staminates might have the pollen destroyed or

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rendered imperfect by frosts or washed off by heavy rains when the other would be comparatively unharmed.

This planting of several sorts together is essentially necessary with the plum; as most varieties are very largely infertile when planted alone. The Rockford is a notable exception to this rule. But the Miner is almost wholly barren when not pollenated by some other variety.

No plum orchard however small should contain less than three or four different varieties; better the latter than less; as the plum generally refuses its own pollen, and it may be washed off from any single variety, or be injured by frosts or cold winds, and so result in the failure of a crop.

It is also now known that both in the apple and in the pear there are varieties that when planted in blocks by themselves fail to produce any paying crops but when planted with other sorts are good bearers.

The Jonathan apple and the Bartlett pear are examples of this sort. And if there are sorts like these, that are almost wholly unproductive, it is safe to conclude that others are partially so, and that they would be greatly benefitted by having other sorts planted near them.

Varieties when moved a long distance either in latitude or longitude, or into a distinctly different climate, often fail to properly perfect their fruit buds and so need the perfect pollen of adapted sorts.

These changed conditions no doubt account for the unproductiveness of so many of the hardy Russian apples.

The plum, cherry and strawberry are notably affected by these changes. Their new environments seriously impairing their bud development.

Perhaps I cannot more forcibly illustrate the benefits derived from perfect pollen than to call your attention to these pears. I said to my daughter the other day that I made them, but let me assure you that neither then nor now was this statement made in a spirit of boasting. The story is this: I was spending the last days of March and the first of April with a friend in California. He is a fruit grower and had some Winter Nelis pears in bloom—this is a pear of finest quality—a winter pear. On my grounds at Charles City we have bearing trees of the Keiffer pear that would be in bloom about a month later than the Winter Nelis where I was. So with thumb and finger I pinched off the anthers from the flowers where two or three of the anthers had already burst and scattered their pollen, indicating that the flower was reaching maturity, and that from such ones the most perfect pollen could be secured. The pollen was then spread upon an unprinted paper in a particularly darkened corner of a room, near a stove to aid the ripening of the anthers, the broken petals and stamens having been previously removed, and in about eight hours the anthers were crushed between the fingers to more perfectly liberate the pollen. When evening came, a lighted lamp was placed under the shelf to insure a continuously moderate warmth until the pollen was fully ripened and dried, which required about thirty-five hours, when it was placed in a small, completely sealed envelope; this in a second, also practically air tight, and this in a third; and then sent home to be used about thirty days later on the Keiffer trees referred to. One limb was selected, the bloom removed from part of the spurs and the pollen applied with a camel's hair brush. On the remainder muslin sacks were put over the spurs to protect from the Keiffer's own pollen, or from loss of fruit should we succeed. The result was that

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we secured eleven pears on that limb, but not a single one grew on the whole tree besides, showing that the pollen had been washed off the entire tree, and that the pistils were still perfect enough to respond to the application of perfect pollen, and this thirty days after it had been gathered, and shipped two thousand miles.

Some of you have seen the catalogue sent out by Luther Burbank, of California, describing his "New Creations," and I am sure that the application of this phrase could not be more aptly applied to the production of any new fruit than to the specimens before you. But the inspiration, only for the lesson that it teaches, is not in the fruit, but in the seeds that it contains. Scientific breeders of animals have formulated a scale of points that must be found in an animal that will permit it to rank as a model of its kind. And while the breeders of the large fruits have not advanced so far as to establish but very short pedigrees, we know that the leaves of a tree are its lungs and that if our tree is to have a strong and enduring constitution it must have perfect leaves, If it is productive, its parentage must guarantee that quality; or if it is to be good or beautiful or well formed or a good keeping, marketable sort, that its parentage must stand back of it and guarantee these qualities. Both of these pears have keeping qualities, and both are good bearers and reasonably hardy. So we hope and believe, that out of the delicious quality of the Winter Nelis, crossed with this hybrid Kieffer, a cross of the Bartlett and Chinese Sand pears, that there will come from the seventy-five or eighty seeds that we have saved, some "new creations," some queenly pears, that will make glad the eyes and the palate and purse of the fruit growers of Iowa and beyond.

HORTICULTURE IN THE ORIENT.

BY REV. C. A. MARSHALL, CRESCO.

I remember when a lad visiting the Crystal Palace in London. It was a bitter winter day, but a goodly share of the building was finished off as a winter garden. It was a delightful change from winter to summer. Inside the air was as balmy as a rare day in June; birds were singing, paroquets were chatting, flowers blooming everywhere and loading the air with their perfume. It all came back to me as in the first week of February, 1903, we sailed away in the good ship "Maltke" of the Hamburg-American Line, said to be "the most luxurious steamer afloat." Leaving the snow banks and the two-foot thick ice of Iowa and wafted by the fag-end of a Dakota blizzard we sailed out through the Narrows of New York harbor for southern seas. Rapidly as we crossed the gulf stream the air warmed, the skies brightened, and the spring-time came in with a bound; and I wondered then as I wonder now, how it will seem when we launch out on "that sea whose shore is never shadowed by a home-bound sail" to enter our desired haven and find there—

> "A land where everlasting spring abides,
> And never-withering flowers."

Madeira was the first land we made and surely if Paradise is anywhere upon earth, it is here. Sixty years had come and gone since I visited the

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favored isle. We dropped anchor at Funchal about sun down and gentlemen came on board in "white ducks" and straw hats, a great contrast to the wraps of New York. The soil of Madeira is scanty but rich. A variation of but ten to fifteen degrees in the temperature the year round enable the people to raise anything they want to. There is considerable moisture there, but I noticed they were watering the plants in the public garden where I sat a good long hour enjoying the scene and taking note of the shrubs, trees, and plants. But on this favored isle flowers bloom everywhere and all the year round—roses, camellias, geraniums, lilies, flowering vines and nasturtiums, make the island a veritable garden of the gods. Madeira was probably the finest grape country in the world at the time of my first visit, and its wine has made it famous. But the dreaded phylloxera or grape disease came and though the grape industry has somewhat recovered, it can never be the same again. A Methodist minister who had lived many years on the island told me that not five per cent of the decoction exported and sold as Madeira wine was the juice of the grape. I noticed, however, that it had lost none of its exhilarating effects. A young tourist of the "Maltke" was struggling with two deck stewards the night we left the isle. "What's the matter, steward, had too much wine?" I asked. "No Sir, that's not it," he replied, "He's not had enough!" Then they "puckerowed" him and took him below.

Gibralter was the next point we visited, and the warm, soft air that swept across the sea from Africa's coast made the trip delightful. Notwithstanding the British have made Gibralter a veritable arsenal, they have also found time to beautify many favored spots with flowers, and in places I noticed flowering vines creeping over the battlements and even looking into the cannon's mouth, "So idly that rapt fancy deemeth it a metaphor of peace." Crossing the bay to Algesiras we took train for Grenada and the Alhambra, immortalized by our own Washington Irving. The route lay for nearly 200 miles through the heart of southern Spain. Near Gibralter the country seemed to be poor, and the inhabitants poorly clad and fed, but as we sped onward the soil seemed better and more highly cultivated. Here we noticed the first signs of irrigation, an art introduced by the early Moors. Fences of cacti surrounded some of the poorer fields, but near Grenada, where a high state of cultivation prevented, there were none. Near Gibralter at every station waiting shipment were bales of cork bark, many of these curious trees growing here. But the greatest sight was the olive orchards, millions of trees crowning hill, valley and plain for twenty or thirty miles. The orange orchards, too, were very fine, and at every station peasants offered baskets of the luscious fruit for a mere song. It was February yet, when we rode through southern Spain, but the peasants, men and women, were working in the fields under the bright, clear skies and the cheery sun. No wonder the women are handsome and the Caballeros a jolly set of fellows. As I thought of Iowa buried under the snow and sealed up tight by the Frost King, it set me to thinking whether, with all our boasting, we really have the finest country and climate in the world.

I was very much struck with the fine avenue of trees skirting the road leading up the hill from Grenada to the Alhambra, while the snow-capped range of the Sierras lift their silver crowns high in air, and impart a delicious crispness to the atmosphere. The Moors were evidently masters in

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the art of hortioulture. The inkish grey turrets of the citadel-palace may enchant the tourist, the magnificent far-reaching views may inspire the artist, but the trees, vines and flowers which wreathe the crumbling walls and cast their glamour over a wonderful chapter of the world's history, will cause the foot-steps of the true horticulturist to linger there as in a dream, and in the years to come his brighter visions will be of the Alhambra, its palaces and parterres, its walls radiant with color, but most of all, its flowers laden with perfume, and when he awakes he will say, "Let me dream it again! Let me dream it again!"

From Gibralter after a few busy hours we landed at Algiers. Here the French have done some fine colonization. Its mild climate makes it a favorite resort for the wealthy English and French families. Many handsome villas and beautifully located white stone hotels are built along the heights, overlooking the blue waters of the Mediterranean, in the midst of rich tropical vegetation. At one of these, the "St. George," we dined, and after dinner I spent an hour or two in the grounds. I should think there were eight or ten acres exquisitely laid out, the oranges and lemons on the trees being very fine, flowers and flowering shrubs being arranged in the highest skill of the landscape gardener. Driving through the country I noticed the vines in the vineyards, of which there were many, were not trained on trellis, and were trimmed down quite short, and I wondered if we have fully learned the Oriental skill in the pruning of the vine. The botanical gardens were an interesting sight for the tourists. The Avenue of Palms, half a mile in length, was composed of almost every variety of this enchanting tree, some growing with tufted tops swaying sixty or seventy feet above our heads, others wide spreading and curiously branching. Then a long avenue of enormous magnolia trees that must be a very fine sight when in full bloom. Then there was an avenue lined with a dense growth of bamboo trees, creaking and sighing in the wind. Acres of immense banyan trees, with great central trunks wide-spreading and sending down roots from the branches which form additional trunks, so that one great tree has many trunks to support it. Then there was the wilderness, where one seemed to be buried in the wide growth of an African jungle and looks furtively for the spring of the lion or the dropping down of some great boa constrictor. It was while sitting in the drawing room of the St. George that I picked up a London paper, and among the telegrams was one from Iowa saying that the thermometer was twenty-five degrees below zero.

A lovely sail along the African coast took us to Malta. It is an island full of interest but not a great deal for the Horticulturist to note. The soil seemed poor and stoney as the most sterile New England farm. From Malta with its frowning fortress and small fields walled around with stone piles we steered for Athens. Entering the port of the Piræus we took train five or six miles fo the Grecian capital. Greece I was told is a land of vineyards and the plains between the Piræus and Athens across which the Ancient Greek troops marched to take trireme for the war are dotted with huge distilleries where the refuse of their vineyards is made up into a decoction labeled "Brandy" which can discount for fierceness any corn juice of our Western distilleries. The Greeks will have to brew another brand before they undertake to fight the Turks again. At the King's palace where our tourists were kindly allowed to enter we found gardens in a high state of

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cultivation and in the public park a splendid statute of Byron looked down upon an array of shrubs and flowers as fine as any we saw. The sun was gilding the old grey columns of the Parthenon as we steamed out of the port of the Piræus and we felt glad at heart to think that for one brief day we had stood among the immortals and that our feet had pressed the rock whence St. Paul declared unto the Ancient Greeks the love of the Unknown God.

Twenty-four hours later the Mosques and Minarets of Stamboul rose out of the Bosphorus. We were in the land of the "Unspeakable Turk." Dirt and dogs, dogs and dirt everywhere. There are some fine gardens around Constantinople, but even the vegetables they brought to town seemed grimed with dirt. I hope our missionaries preach strenuously to those frowzy fellows the Gospel of soap and water. Some one said awhile ago that if the text "Cleanliness is next to Godliness" was not in the Bible it ought to be.

Smyrna in Asia Minor was the next point of interest with a trip by rail of forty miles to the ruins of Ephesus. The Almond trees were in full blossom, beautiful sprays of pink and white.

There were many orchards of fig trees along the road. We expected to get some fine figs at Smyrna, but the best all go to London and New York, and those offered for sale we would not buy at home. The same was true of the dates in Egypt, the best of the fruit is all exported. At Ephesus after viewing the ruins we returned to the railroad depot and there saw a train of fifty camels each laden with two bales of the finest Turkish tobacco file up to the platform and kneel down while their burden was removed.

Beyrout was the first point made in the Holy Land. Here we saw a fine open country backed by the lofty ranges of Lebanon snow-capped, while in the distance we could see the far-famed Cedars. Palestine seems quite destitute of timber. We saw but little all along the coast. We touched at Haifa to land tourists to Galilee. Most of the party went direct to Jaffa and landing amid its dangerous surf took train for Jerusalem. In the orchards round Jaffa are raised the best oranges in the world. Our party bought liberally at twenty cents for a basket containing about one-third of a bushel. They fetch the highest price of any oranges in the London market. Our train passed for a few miles amid orange orchards, long rows of Eucalyptus trees and fig trees just budding into new life. The gardens and fields were fenced with prickly pear or cactus. The farmers were plowing with camels, one camel to a plow and the plow looked like a crooked stick. Sometimes an ox and a small donkey would be hitched to the plow.

The first twenty-five miles out of Jaffa lay through the plains of Sharon and I could understand then what was meant in Scripture by "A land flowing with milk and honey." The rose of Sharon is a red poppy with a black center on a short stem. The barley was still growing rank as in the days when Samson found his fun in sending foxes with firebrands into the fields of the Philistines. The Holy City itself is not much blessed with foliage and shade. At the Kraminski hotel where we stayed, there was a fine garden but much of the land around Jerusalem is of a stony, barren nature. The Garden of Gethsemane is the brightest and most beautiful spot about Jerusalum. Here one of the priests in charge presented me with a spray of olive from the garden and some lovely flowers. They are among my most cher-

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ished souvenirs of the voyage. The cauliflowers raised about Jerusalem are the finest I have seen anywhere and the honey has no equal in any part of the world for delicacy of aroma. Here and there we saw peasants plowing little patches with a single donkey and crooked plow or digging between rocks and around grape vines with a heavy hoe. The grape vines like those in Algeria are trimmed back to within three or four feet of the ground and are not supported or trellised. We were glad of some olive tree grubs to keep us warm during a cold rain on Sunday. This appears to be almost the only fuel they have and sometimes the weather is bitterly cold. Anyone who should come here expecting to see a city beautiful for situation would, I fear, be disappointed. The verdure-covered hills and bluffs around Decorah and and McGregor are beautiful in their ever-changing hues and tints but the bare grey rocks and treeless hills around Jerusalem, though unique and interesting from hallow association cannot be called really beautiful. One lady at our hotel said that she never wanted to hear again of heaven as the "New Jerusalem," the comparison was too odious. Alas the blight of Turkish misrule is everywhere. Jerusalem will be a beautiful place when the "great assassin is cast out."

It was the middle of March when we started up the Nile from Cairo. Rain is almost unknown in Egypt; without the overflow of the mighty river which is fed by the great inland seas of the Nyanzas; without the great retaining dams and irrigating ditches all the Nile valley would be a desert. There is no more joyful message in Egypt than the word which is passed round about August 1st, "The Nile has begun to rise!" We went to Luxor by train; our hotel looked out upon a magnificent orchard of date palms; under my bedroom window a great oleander in full bloom loaded the air with its rich aroma. Roses, geraniums, in short every kind of flower seemed to thrive amazingly. The secret is in the irrigation. Every third day the waters of the Nile are let in and everything living rejoice and blossoms as the rose. I found more pleasure in that lovely garden than in the tombs of the mummied Pharoahs. Everywhere in Egypt the beneficence of British rule is manifest; law and order, improvement in agricultural and horticultural conditions are prevailing. The overflow of the Nile may give but one crop, but the irrigation by the new dams will give three or four crops a year, aided by the warm Egyptian sun and the most fertile soil in the world. It is said the new dams will pay for themselves in five years, or even less. What Egypt needs today is homes and gardens for its rapidly increasing population. The land of the Pharoahs seems to have but few homes between the harems of the rich and the mud huts of the fellahin. Egypt may have a glorious sky and a winter unmarred by frost and snow, but the showers which fall on the rich gardens and broad cornfields of Iowa bring treasures of far higher worth than all the wealth of the Nile. I contrast the poor fellah toiling in the scorching sun as he dips his buckets to pour the slender stream into the irrigating trench, with the Western farmer who sits in his veranda while the showers drop the early and the later rains on his thrifty fields and those lines of Cooper come back to me:

"There's mercy in every place,
And mercy, encouraging thought,
Gives even affliction a grace
And reconciles man to his lot."

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COMMERCIAL ORCHARDS.

BY B. F. FERRIS, HAMPTON.

This old, threadbare, interesting and important subject has been assigned me, and I expect to give some figures and my own opinion. I cannot hope to add to what has already appeared in our society reports. Oldenburg trees are growing here in Hampton that are forty or more years old that sometimes bear fifteen bushels of apples per tree, and are apparently as sound as ever.

The oldest Wealthy trees are some of them as hearty and sound as ever, and they have been in orchards nearly thirty years. They produce more fruit now than ever before. No other kinds that are as desirable as to quality and quantity of fruit have stood this climate and soil so well or so long as these two, and notwithstanding neither are known as keepers. With the cold storage which we expect to have in the near future and quite general, we can if necessary dispense with the later sorts.

Of all things for the commercial orchardist to consider is varieties adapted to his soil and climate. While we have a fond remembrance of our childhood favorites of "back east" and an abiding love for the same, before selecting for profitable purposes, we should acquaint ourselves with what others have under similar conditions. Of course none but the best should be used and a small young tree is generally better than a large old one. Avoid a long list, find out the best and plant no others. One thousand barrels of Oldenburg or Wealthy are more easily disposed of than five hundred of each. Of early apples choose the very earliest. The first on the market is as good or better than the last. The Wealthy apple is conceded to be of better quality than the Oldenburg, but my experience teaches me that the latter is more easily disposed of, because it can be sold about forty days before the former.

For location choose high and dry land. Heavy clay is better than sandy or very black soil. Broken surroundings are better than level prairie. High or low topped trees is still a question. If I wished to start a new orchard I would prefer whips. Trees without branches, four to five feet high and stocky. While this leaves a tolerable long body and a somewhat high top, it makes a much more sightly grove than would be the case with low heads, is much easier cultivated, and is pleasanter all the year, except at harvest time. The body is well protected by common wire screen which are easily applied, very effective and very durable.

I would plant at most four varieties. Oldenburg, Wealthy, Northwest Greening and Yellow Transparent, and no great mistake would be made if the two latter were dropped, although the Yellow Transparent is a good bearer, good fruit, and very early, and the Northwest Greening is also a good bearer, and is very late, large and a good seller even when the market is stocked with eastern sorts.

A neighbor of mine sold sixty-five bushels of the latter for $65 this fall all grown on six young trees about eight years in orchard. An orchard of five acres just north of Hampton owned by F. A. Harriman of this place has rendered an income of not less than fifteen dollars per acre and has run as high as sixty-two dollars per acre. About half of these trees are Olden-

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burg and Wealthy and the others do very little comparatively. It is in blue grass, has been well manured, and heavily pruned with ax and saw and is pastured by hogs, sheep and calves. The above figures are only for the last four years, and if previous records were in existence I think it would be a much better showing. I know it would be if the other trees had all been Oldenburg and Wealthy.

I have read of a man in Texas who planted his trees with a crowbar, but I think a spade the better tool, with a good man behind it, that is not afraid of work; one man can plant a tree as well as another.

HAVE WE NOT BEEN TOO MUCH AFRAID?

BY JOHN C. FERRIS, HAMPTON.

When Iowa was young her small family was hopeful. The early settlers had visions of vast orchards that should rival the famous orchards of New York and the New England states. Conditions seemed to justify the hope. Iowa is in the narrow apple belt of the world. Her wild fruit trees are thrifty and fruitful, the mean temperature about normal for the apple producing regions. Why not have all the best varieties of apples?

Thus reasoning, trees of approved varieties were freely planted. We all know the history of blighted hopes, disappointments and discouragements. Some of our old reports read like the book of lamentations. Our pomological ideal lay shattered among our fallen hopes. Our despair seemed justified by our experience, which we thought was exceptionally bad. Yet, after all, ours was but the experience of all new countries. Science had not then reached such perfection that experts could tell by geological analysis and observations just what could be profitably produced here. Such perfection is not yet attained. There are conditions in every new country not reckoned with by theorists and only learned by experience. It will always be so until all parts of the earth are populated, but one experience was not unique. We had to do just what other states had to do, just what all the world has had to do. We had to endure the waste incident to the selection of the fittest. We had to learn what of merit would survive. Every State in the union has had that experience in one way or another. Well, the people became so much afraid that they cried almost in unison, "We can't raise apples in Iowa." A few brave pioneers persevered and prospects brightened for a time, but a series of unfavorable winters killed or severely injured all but a few summer and fall apple trees. Then even the bravest became so much afraid that we only retained in our list for general planting four varieties, Duchess, Wealthy, Tetofsky and Whitney. That was our list when the northern Iowa Horticultural society met at Hampton. That was nearly twenty years ago. Then experiments along different lines begun in earnest, and we have progressed by importation, seedling production and selection from old standard varieties until we have not only a list of summer and fall apples, but a number of valuable winter varieties. Many old trees of varieties we discarded in the early eighties are still living and bearing abundant crops of apples in northern Iowa. There are near Hampton the

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Fameuse, Willow Twig, Ben Davis, E. G. Russett, Perry Russet, Rawles Janet, Talman Sweet, Pewankee, Roman Stem, Stark and many others of more or less value more than twenty years old. We were certainly too much afraid when we said we could not raise winter apples in Northern Iowa. The people were made afraid by those who discouraged all lines of efforts but their own. They were made afraid by the man with two sticks who contended that black-heart was a quickly fatal disease and contagious. They talked a new graft and practiced a new one every year—on the people. Yet I have just named ten varieties of valuable late apple trees still bearing here. Many of the same varieties were dug up or cut down because the alarmists made the people too much afraid.

It is a mistake to lay too much stress on environment. Now the process of natural selection is faciliated by vigorous conditions. The climate of Russia destroys the unfit more perfectly than that of France. Our own climate has of course the ideal conditions for the production of seed and seedling adapted to our needs. No doubt this will be the basis of our future pomology, but the process of testing and selecting is slow and we who labor want to enjoy some of the fruits of our own activity. There is no natural law that prevents the production of occasional seeds and seedlings among the excellent orchards of the Atlantic states or on the Pacific slope, having all the requisites for profitable planting here. There may be many among the old orchards of the east that will prove of great value here. If so we need not reject them because the original seed fell among the stones of New York instead of the rich loam of the Iowa prairies Iowa seed is much safer for the experimenter to plant for obvious reasons, but the same seed would just as surely produce the same variety if planted in any part of the world where apple trees will grow and thrive. I would not advise the orchardist to plant untried varieties but our experimenters need not confine themselves to western seedlings nor yet to Russians in their test of varieties. Conditions have so improved in western Iowa that we may confidently expect to raise some of the excellent apples of the East. Maybe we have been too much afraid of the tree agent. A little dareful discrimination between a palpable fraud and a possible acquisition might be wiser than our wholesale denunciation of the entire fraternity of traveling missionaries. Even those from other states have introduced some things of value. We have the Northwestern Greening from Wisconsin; Melinda and Peerless from Minnesota; Salome from Illinois; Gano from Missouri, all winter apples and all proving hardy in some parts of our district. In naming winter apples for the north the Repka must not be omitted for it will prove of great value in the most trying situations. It is a fine tree and abundant bearer of good apples of fair size when not allowed to overbear. Here are six winter apples of value in some parts of our district and some of them in all parts.

Then we have a promise of the Yahnke from Minnesota, the Hinkley from Iowa Falls, the Okabena from Mr. Antisdel and others too numerous to mention. In view of the things we have certainly achieved and the valuable varieties that have been tested by individuals and favorably reported, it is time to stop publishing to the world that northern Iowa has no satisfactory winter apples.

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MR. BURNAP: I want to ask the nature of the soil in which those Fameuse trees, of which you spoke as being twenty years old and are still in bearing condition, are growing?

MR. FERRIS: They stand on soil that has a subsoil of yellow clay, on a southern exposure, about two and one half miles south of Hampton. Many of the other varieties mentioned are on similar soil and site in my orchard.

MR. PATTEN: Mr. Ferris has given us evidence of what we can do in this country, and I want to ask Mr. Ferris if he would recommend such varieties as Willow Twig, Fameuse, Walbridge and Haas? If Mr. Ferris would not recommend these varieties for general planting we must begin to discriminate, and while we are not afraid we must be careful. The question is, if the seed comes from some other quarter of the globe, should we welcome it and plant it? I think it is a very erroneous idea. Plant breeding is as important as animal breeding, and if we plant indiscriminately we must expect to have a lot of mongrals which are frightful to look at. We should take seed from the fruit of trees which do the best. If we have a tree from the seed of Willow Twig, we would expect to get fruit of reasonable keeping quality. I think the time has come when we have the very best data that we have ever had to guide us.

In the matter of breeding animals for instance, if a man has got a good line of breeders he had better hold onto that line. We should not plant indiscriminately.

MR. FERRIS: I do not advocate the planting of seeds from Patagonia, but I say that it makes no difference where we receive the trees from, if it is satisfactory. I want Mr. Patten to understand that I am in favor of that statement of his, but I do say that when we have a variety that succeeds we should not shun it because it is not a home product.

PRESIDENT REEVES: Now these varieties are good and as this society has no recommended fruit list, it is well to discuss everything of promise.

MR. PATTEN: Mr. Ferris, why do you plant varieties that you would not recommend to your neighbors?

MR. FERRIS: I plant Fameuse and Jonathan because I want the fruit. I do not recommend them because they are not hardy.

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COMMON FRUITS FOR COMMON PEOPLE.

BY J. S. TRIGGS, ROCKFORD.

It should be the mission of this society to give in a practical, helpful way such suggestions as will enable the common people to grow fruit for their own use. While scientific papers, speeches and discussions are all right in their place, still the measure of usefulness of such a society is best taken when as a result of its work the common fruits are found in the gardens and orchards of the common people. We sometimes think too much effort and time is spent in trying to discover or develop new things and not enough along the line of commending the planting of known and tried varieties. The common man surely needs advice such as this society can give, not only as to what varieties to plant, but more how to care for his fruit after it is planted. He needs information about the common enemies of fruit trees, the borer, the rabbits and mice, and kinds of stock, sunscald, blue grass, about the need of proper cultivation and pruning. Nine out of ten of these common people labor under the delusion that their whole duty in a horticultural way has been done when they have planted the tree, which would only be equalled by the folly of supposing that when a man had begotten a child his obligation and duty toward it was ended. This society could render the common people no better service than to appoint a committee of three of its best qualified members to prepare a bulletin covering as briefly as possible the following:

First. Varteties of fruit suited to northeast Iowa.

Second. How to plant, this to include selection of site, its manner and details.

Third. Care of the orchard after planting.

Such bulletin to confine itself strictly to our local conditions and to be distributed as widely as possible throughout the district.

While the discussions and papers of this society are published they contain such a mass of matter that the common man simply will not take the trouble to bore through it all to get the information he needs, whereas, if a bulletin of the character indicated was obtainable he would gladly read it. The members of this society possess the experience and knowledge covering this question of common fruits for common people and should give it to them.

PRESIDENT REEVES: How could we dispose of the bulletins if we had them?

MR. TRIGG: The secretary could be furnished with a number; any local horticultural society will furnish names of people to send them to.

THE PRESIDENT: I think Mr. Trigg should be encouraged.

MR. TRIGG: I find the borer very destructive to trees in my locality.

THE PRESIDENT: The question box is omitted while Mr. Trigg tells about getting the borer out of his trees.

MR. TRIGG: The borer deposits her eggs in the bark of the tree, near the ground. The life of the maggot is about three

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years. The grub is about as thick as a lead pencil and often over an inch long. The borer may be detected by the refuse cast from the tree; sometimes there are three or four grubs in a tree. The best way to find the borer is to make an examination of each tree, and when found take a knife and go after him. Occasionally I have tried using a copper wire and you will find him in that way.

A MEMBER: Will the ordinary screen exclude the beetle from laying eggs in the bark?

MR. TRIGG: Not if it is close to the tree.

PROFESSOR LITTLE: The grub bores in the tree below the surface of the ground the first winter. Reproduction does not take place in the tree, as has been suggested, usually only one grub is found in the burrow. There are two kind of borers, the Round head and the Flat head, both are injurious to trees, and care should be taken to prevent them from getting into trees.

MR. PATTEN: If the trees are gone over in September and examined for the small spots on the tree just above the surface of the ground, you will find the small worm and can easily kill it without injury to the tree.

MR. GUILFORD: Just make a cut in the tree where the borer is and block up the hole with a common match, and in a few hours you will find the borer, head-first against the match, dead.

QUESTION BOX.

THE PRESIDENT: What variety of gooseberry should we plant?

MR. FERRIS: Downing and Pearl.

THE PRESIDENT: What variety of strawberry?

MR. BLAKEMAN: I find the Crescent the best in this locality. The Beder Wood would be good if it was not for the rust. Another good bearer is the Haverland.

THE PRESIDENT: What raspberries should be planted?

MR. ELLSWORTH: The Cuthbert is vary hardy. I like the black best, but the black varieties have not done well for me for several years.

MR. HANSON: The Cuthbert is very good. Ohio and Older are also good varieties, The Cuthbert crumbles and do not hold out as they should.

MR. TRUE: The Nemaha is better than the Gregg.

A MEMBER: Which is your best purple berry?

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MR. TRUE: I have tried the Columbian, but have not had success with it.

MR. TRIGG: Will it pay the farmer to raise blackberries?

MR BLAKEMAN: I find they are very persistant. They are a nuisance if they get the best of you. I recommend the Snyder as the best blackberry.

THURSDAY EVENING.

After music by the orchestra, President Reeves introduced Professor Newens of Ames, who gave a most pleasing and instructive address on the work being done at the State Agricultural College; after which he gave some extremely entertaining exercises in elecution.

After Professor Newens retired, followed by the applause of the audience, Mr. A. J. Philips of West Salem, Wisconsin, was called and entertained the people with his amusing anecdotes and original humor.

Professor Newens was made an honorary member of the society.

FRIDAY MORNING SESSION.

Meeting called to order at 9:45. Committee on treasurer's report submitted a report as follows:

We the committee on the treasurer's report have examined the report with the accompaning vouchers and find it as submitted to the society.

Respectfully submitted.

C. G. PATTEN,
W. A. BURNAP,
ISAAC JOHNSON,
Committee.

Report adopted.

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Committee on president's address submitted the following report:

Your committee on president's address after carefully considering the same would respectfully report as follows:

We recommend that as a society we take some definite action toward the encouragement of the passage of the "Pure Food Bill" which is likely to be introduced at the next session of our state legislature.

We further recommend a continuation of the committee on seedling investigation in accordance with the plan adopted one year ago at the suggestion of Vice President Guilford.

We favor an action of this society authorizing our secretary to correspond with those veteran horticulturists referred to in the president's address, and who through physical infirmities are deprived of the privilege of meeting with us, expressing the sympathy of this society and of its high appreciation of their past interest and efforts in the work of horticulture.

J. B. MITCHELL,
C. H. TRUE,
G. A. IVINS,
Committee.

The election of officers resulted as follows:

PRESIDENT.

W. H. GUILFORD.....Dubuque

VICE PRESIDENT.

REV. C. A. MARSHALL.....Cresco

TREASURER.

E. BLAKEMAN.....Decorah

SECRETARY.

JOHN C. FERRIS.....Hampton

Director First District, J. B. Mitchell.....Cresco
Director Second District, W. A. Burnap.....Clear Lake
Director Third District, G. A. Ivins.....Iowa Falls
Director Fourth District, C. H. True.....Edgewood

West Union was chosen as place of next annual meeting.

The society adjourned early to visit a fine printing establishment in the city.

On motion of Mr. Symmons, the members of the Northeastern Iowa Horticulture Society were all made honorary members of the Winneshiek County Horticulture Society. Mr. Blakeman, president of the Winneshiek County Society, putting the motion and only members of the local society voting.

The Winneshiek County Society invited its honorary members to a ride around the picturesque city among the hills, which was greatly enjoyed from 1 o'clock until 2:15 P. M.

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FRIDAY AFTERNOON SESSION.

The meeting was called to order by the president at 2:15 P. M.

VINES.

BY MRS. E. W. D. HOLWAY, DECORAH.

Sitting by the fire, one of these cold winter days, looking through the window at the tracing of vines on the house wall, I enjoy the simple picture. Then when the sun shines on the vines which drape a portion of the window, the upper part of the shade is delicately ornamented by that great artist.

I think the shadows on window shades or porch floor are sufficient reason, even if there were nothing more, for growing vines. You will agree with me if you have ever enjoyed the exquise picture drawn in black by a summer moon. The Virginia Creeper stands first with me, for its hardiness, the soft brown of its stems, and the beautiful crimson of its autumn foliage. The form sold under the name of *Ampelopsis muralis* may prove better as it has tiny discs at the end of its tendrils to cling by. The others I fasten to the wall with strips of leather. Sometimes in the summer, I wonder if the wild grape vine is not first of all, with its cool green leaves.

The Bittersweet is well worthy of a place on the wall or the end of the porch. The orange and scarlet of its berries makes is especially desirable in winter. Some claim that vines injure the walls of a house, but in our sunny, breezy Iowa, I doubt it, if they are trimmed, as they should be, every year after they are established. It will only take a few minutes, and surely you would be repaid for your efforts.

Dutchman's Pipe, with its great leaves of light green, likes the pillars of the porch, and seems to be perfectly hardy here. Moonseed, a native, makes a good contrast for it with its heavy dark green leaves. If there is a place in the north or in some corner shut away from free circulation of the air, where mildew occurs, do not plant there. All of these are beautiful for draping a fence, shrubs, or trees.

I like hopvines on barn or fence somewhere in the background. Plant your row or trellis of grapes with thought of their beauty as well as their usefulness. But here in our northern winters, we do not want much between our windows and the sunshine, so we should be particularly grateful for the vines which can be cut down in winter. Of these, nothing could be finer than the group of Clematis.

Our native Virgin's Bower is very satisfactory, growing strong and early, climbing above the first story windows in one season. The two parts of the flower are borne on different plants. The one with the pistils deveiop a fuzzy bunch of seeds which gives it the name of Old Man's Beard. If you want something more dainty, Clematis Paniculata is ready for use. One of the fine things from Japan I think. It has deep green glossy leaves and hundreds of little white flowers which are at their best late in the summer when many of the blossoms are gone. The Jackmani gives a glorious mass of royal purple, sometimes blossoming a second time and holding on

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with the pansies. Coccinea gives a more delicate drapery with quite different flowers, dainty crimson cups. This is lovely planted near the red flowering honey-suckle, of which we have at least one hardy sort. And if you have the honey-suckle you have the added delight of watching the humming birds all summer.

Of the clematis there are many more which I do not know, but these I have mentioned need only a reasonable care in planting and light mulching in the fall. Now I will just mention the biennial Alleghany Vine with its delicate light green foliage and shell pink flowers, and one of the morning glories, Heavenly Blue, which has the most beautiful dark green leaves. Just to look at it on a hot summer day makes one cool. The first should be planted every year, and kept to the second year for climbing. The second ought to be started in the house in pots and I think does not blossom in this climate.

I can only touch upon the subject in so few minutes, but I wish I could convince every one here that there is nothing so expressive of the real home spirit as vines.

THE HORTICULTURAL VOLUNTEER.

BY W. H. GUILFORD, DUBUQUE.

How to enlist a general co-operation of the people in the cause of horticulture is the paramount question that now, and has in the past, and will for all times, confront this and all other societies of the Northwest.

As a rule the early homemakers of Iowa were poor, and struggled hard against adverse conditions. But now matters have changed. The possibilities of our soil are better understood. The markets of the world are open to us. With the increased value of our financial affairs, come the refining influences of better schools, colleges and churches. Elegant country homes are growing up around our cities that are models of architectural art and beauty. In a majority of cases the grounds around those costly homes are arranged in bad taste, or wholly neglected; an unfinished picture; awaiting the developing hand of the landscape gardener.

Iowa, as the Almighty gave it to us, richer in agricultural possibilities than any other State in our prosperous and beautiful nation, is fast approaching the time when her cities, parks and homes, will be ornamented, embellished and sheltered to correspond with her world-wide prominence.

No prophetic eye is required to look into the near future and see the grand possibilities that are opening up before our boys and girls. Every one of whom we hope, will be home makers and home lovers. Then identify yourselves with "the art that does mend Nature." Develop the latent love of the beautiful and useful in Nature. The love that slumbers within you, and only needs awakening.

Our State has produced some wonderful examples of true greatness, in her artisans, her farmers, who guide and protect the agriculture of the nation in her courts and legislative halls. She has given to our country, men whose greatness have gone beyond state and national lines. There are

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more wonderful possibilities wrapped up in our school boy jackets, but no matter how great your achievements in the mature years of life may be, boys and girls, the warmest impulses of your hearts will be clustered around a home and its loved ones. Then early in life cultivate one of the arts of making it sweet home, happy home and beautiful home.

In common with other industrial professions, there is no royal road to prominence in horticulture. The prerequisites are, loving the art of gardening, training and hastening the crude efforts of nature coupled with industry and a courageous perseverance.

We have distinguished leaders among us today whose lives and labors are well expressed in the following lines:

"The heights by great men reached and kept,
Were not attained by sudden flight,
But they while their companions slept,
Were toiling upward in the night".

In looking over the audience we recognize the familiar faces of the little platoon of veterans that have grown gray in our volunteer ranks, like another class of veterans. They come annually to touch of elbows with those with whom they have labored so long and faithfully, enjoying a horticultural campfire as it were when we can compare notes on our successes and failures. See the new creations and discoveries of the past year, to counsel and advise with each other that we may be better drilled and disciplined for the coming years work. Many of us are ageing fast, the sands are running low, as years accumulate infirmities may fall, so that this may be the last time for some of us to come before you pleading in a cause that should, and really does, pervade the hearts of all good people who are identified with the stability, comforts and independence of northwestern life We are living in an age of organization of united efforts. The individual is only valued in the aggregation. The industries of the world are organized for the advancement of their individual and collective welfare. The successes of our neighbor are of little value to us if we do not understand the secret of his success. Organization will develop facts and secrets enough to guide the inexperienced beginner in horticulture after which practice tends to perfection. The leading question upon which the skeptical ponder is "will it pay?" In money, yes; in happiness and the upbuilding of true man and womanhood, a hundred fold.

If you wish to enhance the value of the farm or home, ornament and shelter it as a financial investment. If you intend leaving your possessions as a home to those you love, then join our volunteers, and leave some living emblem of your industry and forethought; something more cheering and comforting than dead, cold, gray granite to perpetuate your memory.

The American volunteer is invincible and ever ready to respond when right and justice is endangered. Without discipline, experience or arms they rushed from the field and factory answering a call to the world's greatest conflict; victory won, their quietly melting away into the peaceful arts of industry was the wonder and admiration of the world. Great in war, great in peace, great in the industrial arts, commerce and trade, and we can develop greatness in the horticulture, in homes, county, state and nation. In recent years the fortunes of war have placed additional responsibilities upon

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us. We now have the area, climate and soil suitable for any branch of the world's horticulture, and we have the intelligence, ambition and perseverance to develop every inch of our vantage ground from Cape Nome to the Philippines.

Where fruits are spontaneous the abundance breeds indolence, it is only on the border of natural adaptability that we struggle to hold the fort and push our advance guard into the realms of uncertainties. As the duties and prospects of success become numerous we must call for volunteers.

It may be truthfully said that we are living in the world's financial age. The avenues leading to wealth are more numerous today than at any time in the world's history, and yet we have more noble men and women devoting their lives to the physical, moral and spiritual welfare of the human family than any age the world has ever witnessed. They are volunteers and their reward will be consciousness of the world being better for their having lived. Like the horticultural volunteer their undivided labors are hardly perceptible in the world's advancement, but they are placing a crumb of leaven here and there, and the entire loaf is surely rising. Results come slowly yet meteors will soon flash across our skies leaving enduring light like the Wealthy apple.

Among the undeveloped and hidden treasures there are many honors waiting us. In the next few years many titles in pomological nobility will be placed. The index finger of fame is pointing in the vicinity of another Minnesota volunteer. If Mr. Yanke's apple maintains the reputation it has already acquired for a few years more, it will bring him wealth and honors both nobly earned. Vigilance, organization, and co-operation will be the price of our horticulture, we will not find it as we do our lead, zinc, coal, etc., and yet it will be a product of our soil. There are many fascinating fields for investigation and experiment that will require the co-operation of many hands. The seedling orchards and isolated seedling trees of our district must be looked up, and those of probable value tested. Some of these trees are as old as the first settlements, having stood a test of hardiness through twenty to fifty years. We must bear in mind that all of our old varieties that are standard throughout the country originated as chance or stray seedlings. If there is any apple of value that is a scientific production it is in the experimental stage and little known. The seeds from the most desirable of these old seedling apples are full of promising possibilities.

But the apple though the most important for us should not monopolize all of our attention. We need improvement in our plums, cherries and small fruits. We should propagate our finest walnuts, hickory and hazelnut, for they are being rapidly sacrificed in the interest of pasture lands, and these delicious products of the forest and the wood lot will soon be of the past. Even the oaks will soon be propagated, as they are now in the East and throughout Europe. We must qualify ourselves not only for the emergencies of the day, but for the conditions that await us in the near future.

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HOW AND WHEN TO SPRAY.

BY E. E. LITTLE, AMES.

Spraying has been practiced for many years in the Eastern states, and is not entirely new to the growers of this State. Five years ago, under the direction of the supervising committee of the horticultural society this work was taken up, and spraying apparatus and materials were distributed to two or three of the horticultural sub-stations, and spraying was practiced for one or two seasons. Wherever the work was carefully and thoroughly done, highly commendable reports were made by the station keepers. This crusade was started mainly for the purpose of introducing spraying methods and bringing it to the attention of the growers throughout the State. It seemed to create a good impression and many of the growers were induced to take up the work, while many others have only just begun and still others are yet to begin. Reports from all parts of the State indicate that where the work has been carefully done, successful results have accompanied the efforts.

During the past two seasons there seems to be a discouraged feeling among some of the growers owing to the excessive amount of rain which prevented carrying on the work in a proper manner, but growers who sprayed during these two most unfavorable seasons report good results. At all of the experiment stations the fruit sprayed during the past two seasons has been practically free from fungus diseases and insect enemies. This shows that spraying under the most favorable circumstances is profitable and to the practical grower it means either good marketable fruit, or poor inferior fruit, only fit for cider and a cheap market.

The grower must keep in mind that it is essential to spray each year regardless of the weather. This must be done to insure against the orchard enemies, which are always present. It is not likely that we will have two such unfavorable seasons as we have just experienced. It has been fully demonstrated that the trees come through the season in better condition, the foliage being of a healthy appearance when properly sprayed.

Spraying has a tendency to call the attention of the growers to the importance of this and other operations in orchard management.

In conversation with one of the pioneers of the Iowa Horticultural Society, he expressed himself clearly and forcibly that Iowa horticulturists must give more attention to the care of the orchard and not attempt to do stock raising and the growing of grain at the same time, and they must take up the spraying proposition if they wish to be successful in fruit growing.

One of the questions that first suggests itself to the grower is how to spray. A person cannot become efficient in spraying without some experience. The first thing he should know is what he should spray for. If the farmer or fruit grower does not know the insects and the fungus diseases that attack his fruit, he can get the information through the literature issued from the United States Department of Agriculture, at Washington, and the State Agricultural Experiment Stations, and articles that are written in newspapers on this subject, or by addressing the Entomologist and Horticulturist at Ames.

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The fruit that is of most interest in this section, and will need the most thorough spraying, is the apple and plum. Some insects that attack the apple are the codling moth, canker worm, and the scales.

Of the fungus diseases that are most serious to the apples is the apple scab, fly-speck fungus and a bacterial disease known as twig blight. The remedy for the apple scab and fly-speck fungus is the common Bordeaux mixture. Where blight occurs the infected twigs must be cut out and removed.

The insects that seem to trouble the plums most are the plum gouger, plum curculio and the black aphis.

The fungus diseases of the plum that are the most troublesome are the leaf spot or shot-hole fungus, plum scab, and the plum rot or brown rot. Remedy for these diseases is the Bordeaux mixture thoroughly applied just before the buds open and then again after the petals have dropped.

The preparation of the mixtures for combating these insects and diseases require some time and care. The common fungicide is the Bordeaux Mixture, and is made as follows:

Fungicide	Copper sulphate	4 lbs.
	Quick lime	4 lbs.
	Water (1 barrel)	40–50 gals.

Insecticides	Biting insects	Paris Green.
		Arsenate of Lead.
		London Purple.
	Sucking insects	Kerosene Emulsion.
		Tobacco Infusion.
		Whale Oil Soap.

The mixtures for the spraying of insects are of two kinds, one for biting insects, such as the codling moth; and one for sucking insects, such as the scales and louse. The application of the mixture is very important, and can only be well done by using the latest spraying apparatus. I will not have time but to mention the different apparatus, some of the apparatus that can be used for different conditions. The knap-sack spray and the auto-spray or sort of compressed air apparatus are small machines, which can be bought very reasonable, and are good for the spraying of small fruits, such as raspberries and strawberries. The barrel sprayer is very serviceable in small orchards or for small fruits. Any orchard under ten acres in size could be profitably sprayed by this machine. The barrels hold fifty gallons of the mixture and this quantity will cover about eighty moderately sized apple trees before the leaves open, that are planted twenty feet apart each way or one hundred per acre. When the leaves are partly open you can spray about one-half as many trees with this amount.

One of the growers this year sprayed about four hundred trees in five hours, the trees being ten years old and one hundred trees to the acre, by this machine. For the larger sized orchard the power sprayer should be used. Under favorable conditions about twelve acres of moderate sized apple trees can be sprayed in ten hours.

Whatever apparatus is used, it is very essential that you have sufficient hose, canes and poles with the best nozzles, such as the vermorel, to apply the mixtures.

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The spraying should be done very thoroughly, all parts of the tree being carefully sprayed. The thoroughness in which the work is done will largely depend upon the success. On a windy day it is a good plan to spray on the side of the tree from which the wind is blowing, so that the fine mist will be carried to all parts of the tree. It is essential that the tree should be sprayed on both sides. The spraying should be done each season and preparation should be made for it during the winter months, by ordering the chemicals and getting the apparatus in order. The work should begin early in the season, just before the buds open, just after the petals drop, and there should be two or three applications and more if needed.

Some of the important points to be remembered.

In conclusion I might say that the best spraying apparatus should be purchased and the grower should have in mind the kind that is best suited to his needs. To secure it order catalogues from a number of firms. (1) Spraying should be practiced each season to insure against the enemies of the orchard. (2) Careful spraying often times means success or failure, large profits or small ones. (3) Spraying must be thoroughly done, all parts of the plant must be properly sprayed. (4) During the winter months if the grower has any leisure time, the apparatus and chemicals should be ready for the coming season's work, so there will be no delay at the opening of the season. (5) In the long winter evenings a grower can get all the recent information on this subject by reading the Horticultural Reports, Agricultural papers, Bulletins of the State Experiment Station and United States Department of Agriculture. (6) If any other information should be desired on this subject, it would be well to write the Horticultural Department of the State Experiment Station. (7) The mixtures, such as Bordeaux can be made up two or three weeks before using in what is known as a stock solution, using 40 per cent copper sulphate, in 40 pounds of lime to 40 gallons of water. This can be diluted at the time of application.

(The professor exhibited photographs and spray nozzles to illustrate his paper.)

A MEMBER: I would like to ask if the dust spray would be as effective as the liquid when there was frost on the trees, before the leaves are out?

PROFESSOR LITTLE: I think not.

A MEMBER: Is it dangerous to handle the gases you mentioned?

PROFESSOR LITTLE: Yes, unless you know how to do it,

MR. FERRIS: If apples are kept in cold storage, at a low temperature, will the fungus continue to grow?

PROFESSOR LITTLE: Yes, but very slowly, if the temperature is low.

A MEMBER: Is there any danger connected with the liquid or dust spraying in case the operator inhales the ingredients?

PROFESSOR LITTLE: There is very little danger from that source.

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A MEMBER: Is it best to dissolve the copper sulphate and lime separately?

PROFESSOR LITTLE: Yes, keep each separate and mix as needed.

The committee on secretary's report then reported as follows:

Your committee appointed to report on the secretary's report concur in the recommendation of our secretary in revising our constitution and by-laws.

G. A. IVINS,
ISAAC JOHNSON,
A. E. BENTS,
Committee.

On motion the report was adopted. The report of the Committee on Treasurer's Report was then received.

We, the Committee on Treasurer's Report, have examined the report with the accompanying vouchers and find it as submitted to the society.

Respectfully submitted,

C. G. PATTEN,
W. A. BURNAP,
ISAAC JOHNSON,
Committee.

On motion the report was approved.

REPORT OF COMMITTEE ON AWARD OF PREMIUMS.

Report of committee appointed to judge and award the premiums on fruit exhibit beg leave to make the following report:

Best collection of apples grown by exhibitor, J. C. Ferris.

Second best collection of apples grown by exhibitor, Wm. Anderson.

Awarding the premiums of the seedlings has been deferred by the consent of the exhibitor until the keeping qualities have been further tested.

Best collection of apples recommended for Northeast District, William Anderson.

Second best collection, J. C. Ferris.

For every variety as above, each plate, G. A. Ivins.....	$5.00
For every variety as above, each plate, J. C. Ferris	2.00
For every variety as above, each plate, J. C. Mitchell...	3.00

Best ten plates of other varieties worthy cultivation; each plate:

G. A. Ivins	2.00
A. C. Smith	1.00
William Anderson	1.00
J. C. Mitchell.....	1.00
Best display of canned fruits and jellies, O. O. Lomen...	3.00
Best display evaporated apples, Isaac Johnson.....	3.00

No entries for exhibits of house plants or new plums.

I submit this report trusting that it will meet the approval of all members of the society.

E. E. LITTLE, Judge.

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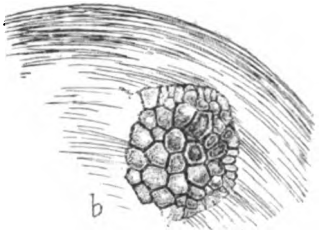

Fig. 1.

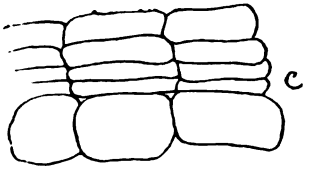

Fig. 2

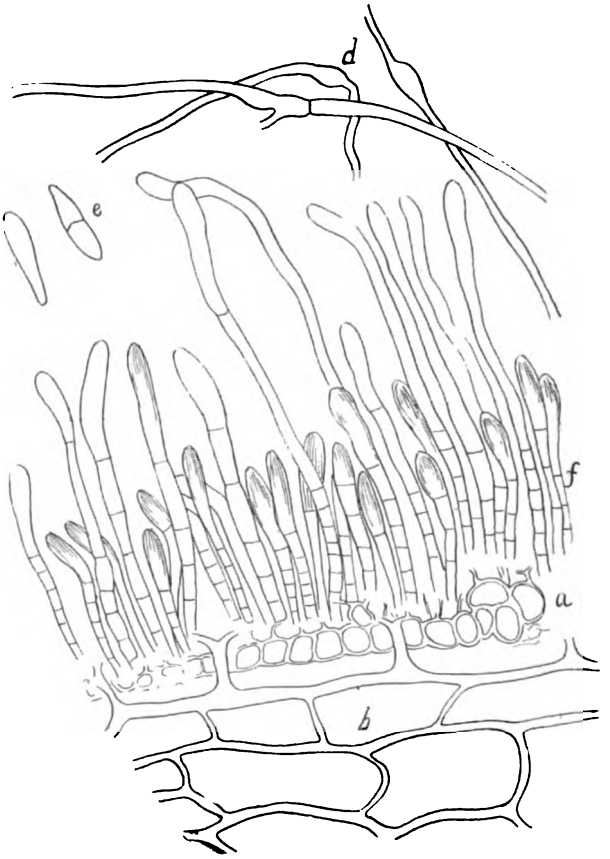

Fig 3.

Fig. 1. Surface view of scabby apple, the appearance of cork cells on the surface.

Fig. 2. Cork cells produced as the result of the scab fungus shown at *c*.

Fig. 3. Apple scab (*Fusicladium dendritricum*) on apple in winter storage. *a*. Epidermal cells *f*. Short fungus cells that give rise to longer threads, the brown conidiosh ores that bear the spores which spread the fungus. The velvety appearance on the surface d ie to the long brown threads. Spores shown at *c*. The underlying cells of the apple shown at *b*.

Charlotte M. King.

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The committee beg leave to make the following recommendations:

That the president of the society appoint a superintendent of fruit exhibits, to have charge of the fruit as it is received from the exhibitor. And to have all the varieties arranged according to season as far as possible, and so labeled, and that each variety be carefully labeled by using a small holder or ticket in which to place the label so it will be in plain view of the spectators who are vitally interested in the exhibit but unfamiliar with varieties. It should be the aim of the superintendent to arrange the exhibit so that the greatest good will come from it. Where the labels are not in sight and oftentimes covered by specimens, the only way a person can determine a variety is to handle the specimen, which may tend to bruise it and then make the entire plate unfit for competing for a premium.

All persons competing for premiums should hand a complete list of his exhibits to the superintendent before the exhibit is opened for inspection.

The exhibit stands for the progress and advancement in pomology in the district, and it appears to the committee that the above recommendations are worthy of consideration in this society.

On motion the report was adopted.

The educational value of this fruit exhibit has been much enhanced by the fine collection of Edson Gaylond, of Nora Springs. It is a matter of regret to the committee and the society that owing to injury by frost this display did not have a fair chance for competition. The society certainly owes this old veteran and his lady a vote of thanks or some more substantial compliment, as Mrs. Gaylond was the only lady in attendance from abroad, and no member has displayed more zeal in promoting the welfare of the society than our old friend Edson Gaylord of Nora Springs.—J. C. FERRIS, Secretary.

W. A. BURNAP: Mr. President, there is a matter which I wish to bring before the society at this time, relative to the injury to our apple crop this season. I gave specimens of Northwestern Greening to Professors Pammel and Little and to Secretary Greene, with a request that they examine them and report at this meeting. I have a letter from Professor Pammel, which I will read, and then we want to hear from the other two gentlemen present in regard to it.

DEAR MR. BURNAP—The apple you handed me at the meeting of the Horticultural Society in Des Moines, has been examined. I find fungi present. Among them a small amount of apple scab. The apple scab is capable of producing just such corky growths. This corky growth may also be induced by other causes. Hail sometimes injures apples and young branches to such an extent that new corky tissue is formed. It is possible that the scab here may have been induced by frost or mechanical injuries. It is difficult to say now what was the real cause. If it were apple scab there is no doubt that treating with Bordeaux mixture will be a perfect preventive.

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Now I should like to hear from Professor Little.

PROF. E. E. LITTLE: In some localities of the north half of the state during the past season the apples in the different orchards were small, very inferior and badly deformed. Some specimens of the Northwestern Greening shown at the winter meeting in Des Moines by Colonel Burnap of Clear Lake, Iowa, were badly discolored and very small in size—not much larger than walnuts.

After carefully examining these specimens it was found that the main trouble was the common apple scab, caused by the apple scab fungus. This disease occurs each year, but during moist, wet seasons, like the past, it is often very destructive. On the fruit was also found large, darkened or discolored patches, and these were found to consist of corky cells, which was thought to be due to the deposit of frost which occurred at the time the fruit was forming. On this corky tissue the apple scab fungus occurred, showing the main trouble was the regular apple scab.

It can only be controlled by spraying with Bordeaux mixture. All orchardists are fully aware that this disease does a great amount of damage each year, and especially during the wet seasons, and the only remedy is spraying.

W. GREENE: I concur fully in the opinions expressed by the other gentlemen as to the cause or causes, which damaged so many apples, not only in northern Iowa, but all over the state. I examined the specimens left by Colonel Burnap, at our rooms in the Capitol, as carefully as the limited time at my command would permit.

Apple scab was present in nearly all stages of growth and the only question at issue was, did or could the disease cause the corky growth noticed on these specimens? and that was quite common on apples in many localities in the state this year. All the corky tissues examined under the microscope showed traces of scab on the outer surface, but the plant was dead in the portion covered by the corky growth, having grown outward from the point of attack which occurred quite early, while the apple was small. The season was so favorable for this disease that probably many spores germinated near each other and grew together thus covering the surface of the apple for half an inch or more in diameter. While the apple crop may have been, and probably was, damaged in many places by frost, hail

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and other causes, yet I believe the greater number of deformed apples this year was from the very severe and persistent attacks of the scab.

SOME MISTAKES IN GARDENING.

BY WESLEY GREENE, DAVENPORT.

Mistakes in gardening are frequently made by not preparing the ground in the fall or early winter for the crops that are to be planted the following spring. We always try to have the vegetable garden plowed just before the ground freezes. By breaking the soil at that time many insects die from exposure which have advanced too far in their transformation to burrow deeper into the ground again. The soil is also in better condition for early planting in the spring as it has not been firmed by fall rains; it dries out quickly as soon as the frost is out. For late planting we replow the ground before it is planted.

Another mistake frequently made is in not preparing the ground properly before the seed is sown. The later in the season the more thoroughly the seed bed should be prepared—that is from May to August. The drier and hotter the weather the more attention is required to prepare the soil for planting. Ground which is temporarily wet when the planting time arrives, should be worked as little as possible to get the seed in, or the plants set. To work soil in that condition tends to make mortar of it. In the spring when the ground is cold and wet it should be thrown up loosely to admit air freely, which is usually warmer than the soil at that time, but as the season advances the soil becomes warmer and the atmosphere drier then the seed bed should be made firmer to prevent loss of moisture. How often have you seen the amateur throwing up the soil in a bed on the lawn with a spade or digging fork late in May, then rake it off nicely and sowing the seed, leaving the soil so loose that if you should step on it your foot would sink into the bed several inches. Should dry weather follow the seedsman is blamed for selling poor seed, when the cause was in the poorly prepared seed bed. Usually there is enough moisture in the freshly-turned soil to start the seeds into growth, but not sufficient to sustain the young plant until it is established. The same difficulty also occurs when transplanting in dry weather, especially if done in midsummer. I have frequently seen amateurs setting out plants that had been grown in pots, water them thoroughly, and then plant in such a bed as I have mentioned, pressing the soil gently about them; the result is the wet ball of earth soon dries out in the loose soil and the plant suffers from lack of moisture. Very much better results would have been obtained if the soil in the pots had been dry so the ball would crumble under pressure of the hand, then planting it in soil that had been properly prepared, pressing it firmly against the roots of the plant—the feet with the whole weight of the body is not too much pressure to apply when the soil is dry—then if water is used pour it on, and as soon as it has been absorbed draw loose soil about the plant and it will continue to grow without the least check from transplanting. Many a plant has died,

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or made a very poor growth for a long time because the soil was not firmly pressed about its roots when planted. A plant that you can pull up in dry soil without breaking its roots has not been properly planted.

Another suggestion I will make is in transplanting while the plant is in leaf, or active growth. The general practice is to reset as soon as possible after the plant has been taken up. When the soil and atmosphere are well filled with moisture this is probably the best course to pursue, but during a drought more care should be taken to prepare the plant to withstand the change. When the roots are much broken the leaf surface should be reduced to correspond with the supply of roots. It requires a little time for the plant to recover from the injury to its roots before the healing process begins. If cabbage, tomato, strawberry plants, etc., can be kept in moist soil and air twenty-four hours they will start new roots and be in better condition to withstand the dry air than if planted as soon as taken up, if the roots are much broken in taking the plant up.

Another mistake is in puddling plants, I doubt if much good results from the practice at any time. Puddling is used to make a moist, air-proof covering for the roots while out of the ground, and will do very well when no other packing material is at hand, but if should always be washed from the roots of the plant before replanting; if this is not done and the soil should become dry in a few days the roots of your plant will be sealed in a little brick, a condition not at all desirable if growth is expected from the plant. I have long since discontinued the practice and have had much better success in handling plants while out of the ground. The transplanting of evergreens is not excepted from this general rule, never to puddle plants before transplanting them.

THE MISSION OF HORTICULTURE.

BY PROFESSOR TRUCKER.

This is a broad subject for a three minute paper. In the first place we can probably agree that horticulture has a mission though we may differ in our definition of the same. The subject will not permit of any statement about how to grow apples and market the same, or what shall be the preparation of the soil for a first-class strawberry bed, or what varieties of flowers and shrubbery are best adapted to the lawn of the farm house or the town home, etc., but simply a few considerations of the general relations of horticulture to the individual.

For the farmer, its mission is, first, an economic one. The lack of time or supply of labor does not prevent attention to the orchard, garden and lawn, except in rare instances. A small expenditure in both money and labor bring large results for the farmer who makes horticulture simply supplemental to his routine life work of grain, dairy, stock, or general farming.

The writer knows of a farm just over the Minnesota line where a little time and attention with only an expenditnre of $25 in money has added to the farm a choice variety of small fruits, apples and plums. Because of the presence of this excellent orchard and garden, $500 or more is added to the value of the farm—a very good investment from that standpoint alone.

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It has further economic value in the healthfulness of its products for the members of the family. The fruit makes a fine addition to the family rations except when the small boy gets hold of the green apples.

We plan balanced rations for the animals in the barn. Why should not the animals in the house be treated as well? Fruit in some form is a necessary ingredient for a first-class ration for the household. Better time and money for the growing of fruit for this purpose, to keep the physical condition of the family good, than to give time and money to the physician.

It is economic because the farm is more attractive to the young people and they are more likely to remain on the farm.

It has a mission of education. In the progress of the race the development of the powers of observation is an early essential. Observation of phenomena, then the discovery of the law back of the same, and obedience to that law are the logical steps in the upward movement; such must be the career of the successful horticulturist. This means that he must be wide awake, and his interests will make him so.

The orchard, the garden and the ornamental shrubbery of the lawn may be made a wonderworld for the boys and girls on the farm. One noted writer said: "The world is enlarged for us not by new objects but by finding more affinities and potencies in those we have."

The farmer who has given due attention to the horticultural division of his farm has a first class school in which to educate the young people and a good supply of hooks to hold them to the farm. Even if they leave the old home the reverence and fondness for the place will be greatly increased. How can they sing, "How dear to my heart are the scenes of my childhood"—"The orchard, the meadow, etc.," if there was no orchard. Boys and girls should know all about grafting and pruning of trees, transplanting, cultivation and mulching of small fruits. By mastering the processes and the principles that underly them they will form a friendship for these forms of plant life. The drudgery will vanish because they will observe another phase of the mission of horticulture viz, the esthetic value.

The beauty of the growing fruit, shrubbery, trees and flowers has its own silent but potent influence which can be felt if not explained. The patient care required is a preparation for the appreciation of this beauty. Such an appreciation is a valuable asset for any person young or old. It enriches life, which should be the prime object of all progress.

Linneus, the great botanist once said of the unfolding of a blossom, "I saw God in His glory passing near me and bowed my head in worship."

There is a social mission also in the hospitality of the farm. The writer always prefers the farm where there is a berry patch, an orchard and flower garden, and it is probably the same with others. We cannot always kill the fatted calf when our friends drop in on us. If we are socially inclined there are not enough calves to go around. The fruits and flowers aid greatly in the welcome extended to our friends.

The horticulturist is a servant and benefactor of his country. He is a true patriot. He not only serves his country but the results of his efforts make it a more hospitable and beautiful land. Peter Gideon was a public benefactor when he produced the Wealthy apple. On an eminence in the cemetery at Concord, Mass., are the graves of Emerson, Hawthorne and of other noted personages. On the same grassy knoll is the last resting place

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of Ephriam Bull the originator of the far-famed Concord Grape. His honor is as great as that of his companions in the city of the dead.

The writer feels that he must not conclude without a word concerning the patriotism that may be expressed through forestry, whether it be the planting of trees for a wind-break, for ornamentation, for the roadside, or for wood production, or the proper management of forests already in existence. Our interests should include all, whether we dwell in the forest regions or not Much planting has been done on these prairies but the mission of horticulture is to create beautiful estates, well furnished with all the attractions of orchard, gardens, shade trees and well-kept lawns. They demand time, patience and care, but the return is many fold, both for ourselves and for others who may share the beauty though they may not own the acres.

"Let dead names be eternized in dead stone,
But living names by living shafts be known;
Plant thou a tree whose leaves shall sing,
Thy deeds and thee each fresh recurrent spring."

EVENING SESSION.

The meeting opened with the reading of the report of the committee on resolutions.

Your committee respectfully reports as follows:

Resolved, That the thanks of this organization be extended to our efficient and courteous president Elmer Reeves, and his capable and hard working co-laborer and secretary, J. C. Ferris, for their efforts in making this meeting one of so great pleasure and profit.

Resolved, That our greetings and well wishes be sent to our beloved and honored members, O. A. Kenyon, C. F. Gardner, Capt. R. P. Speer, and all others who, on account of sickness, have been denied the pleasure of being with us here, and we hope with them and for them better health, greater strength, and brighter days, to come.

Resolved, That we extend our heartfelt sympathy to our co-workers, W. H. Guilford and Clarence Wedge, in the deep family affliction that have met their course the last year. If the burden they must bear alone can be lightened by the thought that we would share it with them if we could, then let it rest softly upon them.

Resolved, That we fully appreciate and heartily thank the citizens of this beautiful town of Decorah and vicinity for the cordial welcome and royal entertainment they have given us the past few days. We should be glad to mention personally those who have worked so hard for us and extended so many kindnesses to us, but refrain, because such mention would include so many of your citizens of all circumstances, trade and profession that it would sound too much like reading the census of your population.

We shall always remember Decorah and its people with admiration, gratitude and pleasure. Respectfully submitted,

C. G. PATTEN,
W. A. BURNAP.

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The Hon. Silas Wilson then gave an address on the St. Louis exposition. The remainder of the program was rendered by the citizens of Decorah.

(The following supplementary report on seedlings has been filed with the secretary:)

AWARD OF PREMIUMS

SEEDLING FRUITS ENTERED AT THE NORTHEASTERN IOWA HORTICULTURAL SOCIETY MEETING AT DECORAH, IOWA, DECEMBER 16–18, 1903.

Best collection seedlings grown by exhibitor, G. A. Ivins, Iowa Falls, Iowa ..... $ 2.00
Second best collection seedlings grown by exhibitor, A. C. Schmidt, Wadena, Iowa 1.00
Best seedling not exhibited prior to 1897, Riggler No. 3, W. H. Guilford, Dubuque, Iowa 4.00
Second best seedling not exhibited prior to 1897, Ivins Pippin, G. A. Ivins, Iowa Falls, Iowa 2.00

I beg leave to make the above report.

E. E. LITTLE,
Committee on Awards.

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Twenty-Ninth Annual Meeting

OF THE

Southwestern Iowa Horticultural Society,

HELD AT

GLENWOOD, IOWA, DECEMBER 15, 16, AND 17, 1903.

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OFFICERS FOR 1904.

PRESIDENT.

C. H. DEUR ..... Missouri Valley

VICE PRESIDENT.

F. P. SPENCER ..... Randolph

SECRETARY.

W. M. BOMBERGER ..... Harlan

TREASURER.

J. P. JACKSON ..... Glenwood

DIRECTORS.

First District—D. B. McCalla ..... Clarinda
Second District—A. F. Collman ..... Corning
Third District—A. F. Collman ..... Corning
Fourth District—J. H. M. Edwards ..... Logan
Fifth District—James McGinnis ..... Griswold
Sixth District—S. W. Wilson ..... Waukee

FRUIT DISTRICTS.

First District—Mills, Montgomery, Fremont and Page counties.
Second District—Adams, Taylor, Union and Ringgold counties.
Third District—Clark, Lucas, Decatur and Wayne counties.
Fourth District—Pottawattamie, Harrison and Shelby counties.
Fifth District—Cass, Adair, Audubon and Guthrie counties.
Sixth District—Madison, Dallas, Warren and Polk counties.

LOCAL COMMITTEE.

H. B. Kees, L. H. Pickard, T. H. Smith, Mrs. D. E. Morris, Mrs. O. F. Graves, Mrs. Joseph Beh, all of Harlan.

LIFE MEMBERS.

Alger, W. S ..... Villisca
Barnhill, O. H ..... Holt, Mont.
Bomberger, W. M ..... Harlan
Bordner, W. E ..... Onawa
Coleman, J. E ..... Farragut
Cappock, John A ..... Griswold
Davis, Thomas A ..... Council Bluffs
Deur, C. H ..... Missouri Valley

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Everett, Leonard.....Council Bluffs
Fouts, A. W.....Missouri Valley
Gay, E B.....Griswold
McGarvin, J. S.....Missouri Valley
Giddings, E. T.....Missouri Valley
Greene, Wesley.....Davenport
Leggett, Frank B.....Council Bluffs
Murphy, J. W.....Glenwood
Van Houten, George.....Lenox
Waterman, F. G.....Fresno, Cal.
Williams, L. A.....Glenwood
Wood, Alexander.....Council Bluffs

HONORARY LIFE MEMBERS.

Bonham, A. S.....Council Bluffs
McGeehon, R. D.....Atlantic
Sterns, Mrs. M. R.....Logan
Taylor, F. W.....World's Fair, St. Louis
Terry, H. A.....Crescent
Terry, Mrs. H. A.....Crescent
Williams, L. O.....Lincoln, Neb.

HONORARY MEMBER.

Stephens, E. F.....Crete, Neb.

ANNUAL MEMBERS.

Bogart & Miller.....Glenwood
Bower & Bro.....Glenwood
Buffington, C. R.....Glenwood
Buffington, W. N.....Glenwood
Carry & Fleming.....Glenwood
Carter, J. W.....Glenwood
Cheyney Bros.....Glenwood
Collman, A. F.....Corning
Daniel Bros.....Glenwood
Dean, Seth.....Glenwood
Deur & Wilson.....Glenwood
DeWitt, C. H.....Glenwood
DeWitt & Co., W. W.....Glenwood
Dick, H. A.....Glenwood
Donelan, J. M.....Glenwood
Donnelly Bros.....Glenwood
Edwards, J. H. M.....Logan
Edwards, M. G.....Glenwood
Erwin, A. T.....Ames
Funches, C. M.....Glenwood
Garret, C. O.....Hastie
Gawens, G. W.....Missouri Valley
Genung, L. T.....Glenwood
Gillilland, Shirley.....Glenwood
Hanson Bros.....Glenwood

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Heinsheimer, D. L ..... Glenwood
Hester, F. E. L ..... Glenwood
Howard, W. J ..... Glenwood
House, A. J ..... Glenwood
Humphrey & Dull ..... Glenwood
Ivory, T. W ..... Glenwood
Jackson, J P. ..... Glenwood
Jamison, D G ..... Glenwood
Lamb, W. W ..... Glenwood
Landis & Jamison ..... Glenwood
Laraway, W. F ..... Glenwood
Lotspeich, D. W ..... Woodbine
McGinnis, James ..... Griswold
McCalla, D. B ..... Clarinda
Mickelwait, R. R ..... Glenwood
Morgan, W. H ..... Glenwood
Peters, S. H. ..... Glenwood
Plimpton, W. W ..... Glenwood
Record, J. F ..... Glenwood
Ridgeway Lumber Co ..... Glenwood
Robinson, L. S ..... Glenwood
Sabin, A. C ..... Glenwood
Sharpe, C. M ..... Glenwood
Shriver, F. M ..... Glenwood
Spencer, F. P ..... Randolph
Stillwagon, L. A ..... Glenwood
Swope, J. A ..... Glenwood
Tonslee, C. H ..... Glenwood
Wallace, F. W ..... Glenwood
Waterman, J. L ..... Glenwood
White, R. C ..... Glenwood
Williams, M. J ..... Glenwood
Wilson, S. W ..... Waukee
Wright, Fay ..... Glenwood

SPECIAL MENTION.

Regular meeting will be held at Harlan, Iowa, December 13, 14, 15, 1904.

A special summer meeting will be held at Council Bluffs, Iowa, at a date to be fixed by the executive officers of the society. This meeting will be held in connection with orchard visitation. The programme will be made up in early summer. Items of interest are solicited from all persons in the district as well as from members of the society.

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LIST OF PREMIUMS

TO BE AWARDED AT HARLAN, IOWA, AT THE ANNUAL MEETING, 1904.

	First.	Second.	Third.
County display of fruit	$10.00	$7.00	$4.00
Individual display of fruit	8 00	5.00	.....
Plate of five seedlings	3.00	2.00	.....
Collection of vegetables	3.00	2.00	.....
Display of canned fruits	5.00	3.00	.....
Best collection house plants	2.00	1.00	.....
Best collection cut flowers	1.50	1.00	.....
Best plate of five each of the following apples	.30	.20	.10

Ben Davis, Benoni, Fameuse, Fall Winesap, Grimes, Janet, Jonathan, Lowell, Oldenburg, Red June, Roman Stem, Winesap, Maiden Blush, Wealthy, York Imperial, Gano, Missouri Pippin, Utter, Sheriff, Minkler, Northwestern Greening and Wolf River.

In county collections fruit must be grown in county, and there must not be less than twenty-five varieties, in good state of preservation and correctly named

In individual collections there must be at least fifteen varieties in a good state of preservation, correctly named; the fruit must be grown by exhibitor, and on demand he may be required to make oath to that fact

Canned goods must be put up in glass, and not less than pints.

Jams and jellies must be put up in not less than half pints.

Parties desiring to enter same variety in different classes must have duplicate entries, as the same fruit will not be awarded two premiums.

Exhibitors must properly label varieties, and file with the secretary a full list of varieties in each exhibit. In plate premiums exhibitors shall enter all names in one list.

If exhibits are small and unworthy of premiums offered, the society or committee may award a smaller amount of money or refuse to award premiums on unworthy exhibits.

See volume 31, pages 455 and 466 of report, for rules governing awards by committee.

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PROCEEDINGS OF THE

Twenty-ninth Annual Meeting

OF THE

Southwestern Iowa Horticultural Society

HELD AT

Glenwood, Iowa, December 15, 16 and 17, 1903.

The session was opened at 2 P.M., December 15th, in A. O. U. W. hall, Glenwood, Iowa, with President J. H. M. Edwards in the chair and other officers present. After invocation by Rev. Mr. Martin the president gave brief address of welcome to all.

The subject, "What Lines of Farming Can be Associated Pofitably With the Work" was taken up in paper by I. N. Brown, Atlantic, Iowa.

WHAT BRANCHES OF FARMING CAN BE ASSOCIATED PROFITABLY WITH THE WORK?

BY I. N. BROWN, ATLANTIC, IOWA.

I can think of nothing to my mind that would work better than fine hogs and poultry. The horticulturist is trying to produce the best in fruits and plants, which gives him a desire for the best of other products. Other lines of farm work, or other breeding of stock, would take too much time from the nurseries or fruit, and if there was neglect there, we are well aware there would be no profit; but a few choice poultry and the best breeds of

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hogs would not consume a large amount of time in care, to give good results. Then the nurseryman or fruit grower must keep in touch with the times and, while he is exhibiting his fruit or speaking of nursery stock, it would be very easy to let people know that he also had the very best Poland China or Chester White hogs to be found in the country and would, I believe, get a balance on the right side of the ledger, for a great many in their chosen line of work do not always get the balance in the right place.

Now then, it would give a diversity of work if your fruit got caught with late frost or an exceedingly dry spell. Then you would have the returns from your hogs and poultry to fall back on, which would be better than using the money which had been deposited in the bank in past bountiful years.

If you should undertake to raise poultry or swine or follow any other line of work, for that matter, get the best. Take a yard of poultry of some good breed, all marked just the same, or a nice drove of hogs all uniform in color and size, and what is there to be prouder of to the man that is trying to help his fellowman, than to know you have the best in your line for your neighbor to select from, at prices that will leave you something after paying for feed and labor. There may be an over production at times of common or medium trees, fruit, poultry or hogs, but always a demand for choice stock, that is considered best in the country, so if he continues to raise the best his stock will soon advertise itself.

WESLEY GREENE: Dairying may be added to fruitgrowing and gardening with a profit, and save expenses in marketing, as the same patrons would use the other product. The surplus fruit or vegetables can be given to the stock. Hogs can sometimes be used to advantage to gather the windfalls, but they should not remain in the orchard longer than necessary each day to consume the fruit that has fallen. The trampling of stock firms the ground and injures the trees.

J. H. M. EDWARDS: I think the shoats turned in a large orchard to graze are a benefit to gather up vermin, culls, etc.

JAMES MCGINNIS: As a rule orchards are mixed tracts and tight fencing includes other things that hogs may injure, so do do not favor it. I do not like chickens there. But we think that the idea of diversity is good and approve of it.

SELLING VALUE OF ORCHARDS AND ORCHARD LAND.

BY SAMUEL HOLMES, HAMBURG.

With the understanding that the committee desire discussion on the selling value of lands suitable for orchard purposes, selling value of lands and orchards after the orchard has been established and the selling value of the fruit crop in the orchard in bulk on the trees, these will be so treated in this paper.

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I do not think the character of the soil in this section of the country need be much different for orchard purposes than ordinary farming. Small and large fruit do well in southwest Iowa on all its soils. The selling value then of lands designed for orchard purposes consists (1st) in the market value of the land for any purpose, (2nd) convenient of location (a) to a home market (b) or some public conveyance that can get the product to a more distant market quickly, (c) easy of access to and from main thoroughfares, (d) ease and convenience of cultivation and development, (e) facilities for establishing a beautiful, pleasant and permanent home. All these conditions should exist in a good degree to make a model fruit farm. Such lands are more to be coveted than Texas oil wells, Colorado gold mines or stock in Pennsylvania steel trusts. With even a small tract of such land and a reasonable degree of energy, economy and common sense any man can make a good living, a beautiful home and have a good bank account in a few years, and enjoy the fruits of his labor and the associations of the best class of citizens while doing it. The selling value of such tracts of land can hardly be estimated in dollars and cents.

In considering the selling value of land and trees in an established orchard, there are many circumstances to be taken into account in addition to what has been said about the selling value of the land alone. The value of fruit-producing vines, shrubs and trees is greater than the market value of the fruit they produce. They have what may well be termed an esthetic value. The inspiring and elevating influences that come from the beauty and fragrance of trees and shrubs, of beautiful foliage filled with balmy blossoms and luscious fruit, are beyond our conception and more than a painter can picture. A veritable paradise on earth The enjoyment men get through the senses of sight, smell, touch and taste are developed in a high degree in a well planted and well cared for orchard. Whether the home be palatial or "ever so humble" amidst such surroundings, fond recollections will hover around the home with an apple tree by the well, a peach tree near the porch, grapes in the arbor, the rose bush by the walk, and the hands that planted and cared for them, long after the occupants of the rustic chairs under the bowers have been transplanted from the paradise below to the paradise above. While some may think such considerations too remote to enter into the selling value, it is worthy of note that conditions which cultivate and develop a taste and love for the beautiful, and add pleasure and enjoyment in life, have both a material and esthetic value which must be taken into account in estimating the selling value of an orchard home. From the time the land is prepared and the trees planted the value increases yearly, and the selling value of the orchard increases in proportion to their development. This value does not depend entirely on the cost of the land and trees and expense of caring for them, nor on account of the product therefrom, but each year, as the trees increase in size and the orchard in beauty, there is added an additional value. These values will be enhanced in proportion to the taste, judgment and care exercised by the owner. These considerations and the considerations heretofore named necessarily enter into and constitute the selling value of all orchards. As an actual illustration of this principle I cite an instance which recently occurred: Ten years ago "A" purchased an average tract of 160 acres for an average price in the neighborhood of $30 per acre. It was all

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planted to fruits. All the care and labor were done by employes and renters of the land. No improvements beyond necessary repairs were added. When the trees came into bearing the average price of lands with similar improvements in that neighborhood was $60 per acre. "A" sold his 160-acre orchard about a year ago for $100 per acre.

It may be further illustrated as follows:

The value of 100 acres of land for farming purposes ten years ago was $30 per acre	$3,000	
Rental per year $3 per acre	3,000	
The actual selling price now $60 per acre		$ 6,000
For orchard purposes the land cost $30 per acre	$3,000	
Cost of planting and caring for trees, estimated	2,0 0	
Rental value of land	1,500	
The present selling value $100 per acre		$10,000

The selling value of the fruit in an orchard on the tree can only be estimated with any degree of correctness by the exercise of good judgment and practical experience. Many fruit growers have sold their crop at great sacrifice because they were lacking in one or both of these requisites. Fruit merchants who practice buying fruit in bulk on the tree in the orchard have both of these qualifications developed in a good degree, and all doubts are rendered in their own favor.

A gentleman had a ten-acre orchard which contained an average crop of apples. Lacking in experience and perhaps proper judgment, sold the crop on the trees in bulk at the terms agreed upon, which seemed to him a good price. The buyer realized from that crop a profit of $1,000 clear of all expenses of picking and marketing. Several instances of like import have come to the writer's knowledge during the last few years. With the usual facilities of the fruit grower he can earn good wages in picking and marketing his crop himself, besides save the greater part, if not all, of such profits.

To acquire the requisite knowledge of the selling value of orchards is a part of the owner's duty as a fruit grower, if he would protect his own interests. This may be done with a good degree of certainty by a careful comparison of the amount of fruit on several trees with other trees, and then taking an accurate measurement of the fruit on such trees, and the cost of picking and marketing the same; from this basis make a careful estimate of the number of barrels or other measurement, and the cost of marketing all the fruit in the orchard. In this way the exercise of the ordinary care and judgment on the part of the seller, will enable him to guard against imposition while disposing of the products of the orchard.

C. H. DEUR: We approve of what has been said in this paper and hope to realize on lands that we have in orchards.

F. P. SPENCER: That was a low price for land planted in orchard. I think I know the land referred to; it has been planted twelve years.

R. M. TROUT: Your orchards cannot be counted on as being in full bearing until they are twelve to fourteen years old.

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JAMES MCGINNIS: There are different experiences. I get a good crop of apples after eight years of age, and a twelve-year-old orchard has given me four crops.

WESLEY GREENE: At the Apple Growers' Convention, recently held in St. Louis, it was stated by members present that eight to twelve years was considered the average time for orchards to come into bearing.

R. M. TROUT: I think that rampant wood growth retards fruitfulness.

W. M. BOMBERGER: Coming into early bearing or late is a matter of soil; also of seasonal extremes. Early bearing occurs in selected locations, especially favored, as can be found in Mills, Cass and Pottawattamie, as well as other counties. I have seen over a bushel of Ben Davis picked off trees set three years in orchard.

MR. MCGINNIS: My location is very favorable and induces early fruiting. Stronger soils, those filled with humus, continue the rampant wood growth longer than poorer soils. We have tried girdling the Early June to bring young trees into profitable bearing. Four years' test has proven it effective and not injurious to the trees.

WESLEY GREENE: Is it not a fact that an orchard for home use can be grown on any locality and in any soil that will produce farm crops; but for a commercial orchard we think a proper location and favorable soil should be chosen. Our dark loams, rich in humus, are not the best for orchards. A careful selection of varieties should be made for the different soils.

JAMES MCGINNIS: We have in prime condition Ben Davis, Jonathan and Grimes Golden twenty-seven years old. Fameuse is one of the longest lived trees, but the fruit is lost as farmers do not gather it.

F. P. SPENCER: We do not let that variety go to waste; if picked at the proper time it will keep well through winter.

F. P. SPENCER: What package you should use all depends on the prices you can get for your fruit. In case it is possible to get a high price for special grades, then use a box or more expensive package, but for general use the barrel is the package. In the matter of packages, cost is a great item, and barrels are getting high. Those unsupplied who buy late are taken advantage of. We buy out of season in excess and store them. I believe it pays to set up a cooper shop and make your own

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barrels in the winter season. I find this easily done, and coopering is not hard work, it does not require an expensive outfit. Wire hoops are not easily put on, as the wire does not drive well and a special machine is needed for it. The machine is expensive. I think barrels will be higher, and forethought is necessary to provide against such a contingency. Coopering is easily learned and a short time of observation in a shop will give ample instructions.

E. B. GAY: The Lislie quart box has been used this season because of necessity, we could not get anything else. A change from a square to a long box has given some trouble, the long box is not liked so well. If a little care is given and it is properly filled it will hold very nearly as many berries as the square, wine measure box.

MR. PETERS: In marketing cherries, we use grape baskets, they are best.

W. M. BOMBERGER: I use the grape basket in gathering and as a unit of measure for cherries, we call six one bushel. We pay from five to ten cents per basket to pickers. We place a surplus grape lid in the diamond baskets, with a newspaper on top of it, then pour two full grape baskets into each diamond basket and sell it on a basis of one third of a bushel. This is as large a bulk as can be handled well together. High-priced fruit can be sold in quart boxes, but we do not sell many that way, but use grape baskets for distant shipment, and diamond baskets for nearby market.

BEST COVER CROP FOR ORCHARDS.

F. P. SPENCER: It depends on the age of your orchard and whether it is in bearing. We would put a bearing orchard in clover. Use something to prevent washing of soil and that will hold snow.

J. W. MURPHY: An excellent cover can be made of clover; in case of necessity weeds would do. Cut the weeds while green. I have clover that reseeded itself for nine years in part of my orchard, and that works nicely, but clover will bring gophers, mice and rabbits, and a warfare is necessary against these pests. We poison the first two mentioned.

A. W. FOUTS: Mice will girdle and kill the trees.

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J. W. MURPHY: I use strychnine, in pulverized form, mixed with dry cornmeal; place it in the runways and it will destroy most of them.

JAMES MCGINNIS: We mound with fresh earth to prevent mice from girdling the trees.

W. H. BOMBERGER: The collar of trees, plants and vines receive a very great benefit from mounding. Freezing and thawing at this point is highly injurious to the plant. When banked so the collars are covered all remain dormand and frost-bound; in fact, everything winters better.

J. W. MURPHY: Where snow lodges the moisture increases, and when the ground is covered evaporation is checked.

L. A. WILLIAMS: I use alfalfa, cut two crops and let a third stand knee high.

J. P. JACKSON: I hardly think we should remove a crop of hay and impoverish the soil.

J. W. MURPHY: I find that if you let a heavy crop of clover drop it tends to smother out the plants and will not reseed. I do not think it would injure the orchard to remove an occasional crop of hay.

C. H. DEUR: Our experience is like the last speaker, we cut it and remove the first crop and it has reseeded for six years.

F. P. SPENCER: For the first five or six years, when only wood growth is wanted, the growing of corn crops among the trees is all right, but when the orchard is in bearing a new draught is made on the soil; this is to produce fruit, and you will have to supply your trees with the necessary food if you want them to be fruitful.

METHODS OF ORCHARD CULTURE.

J. W. MURPHY: There are too many methods.

L. A. WILLIANS: Having the oldest large commercial tract at Glenwood, would say my last method was using the ax.

J. W. MURPHY: That is what it will come to if there is an excess of cultivation. There are too many methods and experiments, If you have good ground, you can safely raise a hoed crop in the orchard, especially in tomatoes, pumpkins, squashes, turnips, or any vine crop. Oats will do if cut green.

E. B. GAY: I use corn two or three years, then prefer soy beans. They are as good, or better, than clover and admit of early culture of ground.

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C. H. DEUR: We even hoe out the weeds in the tree rows and keep them clean.

E. B. GAY: I use disk in stumpy ground and where it is rough.

J. H. M. EDWARDS: I use a five-tooth cultivator and find it a good implement to clean out the weeds in tree rows.

C. H. DEUR: If we could control the weather, we could the weeds. Last season a five-tooth cultivator was not of much use. A small diamond plow or any tool that would destroy the weeds by cutting and covering them was a better implement to use.

PRESIDENT'S ADDRESS.

BY J. H. M. EDWARDS, LOGAN.

Dear Fellow Members: The year just past will be long remembered with its mixture of snow, ice and apple blossoms, on the 29th day of April, dashing to the ground our hopes, by almost obliterating as fine a prospect for a crop of fruit as we ever saw in Iowa. Some one has said "If our multimillionares keep on endowing chairs and fellowships and colleges and universities and every other part of the scheme for education they will presently be destroying the greatest joy of which the mind of man is capable—that is the joy of achievement under adverse circumstances."

Fortunately for us, we are in no danger of being thus robbed in our chosen avocation, for we certainly have the adverse circumstances. How much joy are we getting out of it is the question in point. Looking the situation full in the face, we are inclined to believe that we are *not* of all men most miserable. Ours is a goodly heritage after all. We live in an age and in a land in which labor is both necessary and respectable. The daily toil necessary to secure and maintain our happy homes, insures to us sound sleep, and good appetites, without which all things else could not make us happy.

A thought worthy of our notice is that with the most adverse conditions almost that we could imagine, *we have fruit and to spare*. Most of us are largely endowed with faith and hope, and we look forward to the year before us for better results. We are fast coming to the time when orcharding and farming is not going to be done in the loose haphazzard way that it has been done in the past. The requisite amount of plant food, the kind of treatment the barren tree in our orchard needs, the effective remedy for all insect pests and diseases of plant or tree, will no longer be an unknown quantity, but will be as simple as the churning of butter, or the converting of corn into pork and beef. Already an enemy of the codling moth has been discovered and is likeley, in the near future, to be imported into this country. If this proves a success, it will greatly simplify the problem of growing sound apples.

This year the old lesson is repeated. Most of our apples were Duchess, Wealthy, Ben Davis and Jonathan. And still we hear the cry about the

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inferiority of the Ben Davis. The truth is simply that the Ben Davis, as grown in the Middle West, is in competition with the Baldwin of the East. We should let others, who have an ax to grind, complain of Ben Davis and call him names, but we should be good to the goose that lays for us the golden egg.

At the November meeting of the American Apple Growers' Association in St. Louis, out of 163 members 119 reported. These owned 17,740 acres of apple orchards, containing 1,024,104 trees, an average to each member of 8,707 trees. Of these 45 per cent are Ben Davis. The next most numerous variteties were Jonathan and Gano. None of these orchardists expressed any regrets at having so many Ben Davis.

When we get down to business, as our Eeastern brother does, fertilize, cultivate, prune and spray, we shall get results that will be both pleasing and profitable. We need at least double the acreage of orchards in southwestern Iowa. In the last decade there has been only an increase of 15 per cent in the orchard plant, while the population of the United States has increased 20 per cent in the same time. The foreign demand for our fruit was never so great as now. While I would not discourage experimentation, yet I think what we need more than new varieties is to grow fruit of better quality of the varieties we now have, and know to be well adapted to our locality. It would be well if we could combine for mutual protection against unprincipled wholesale houses in order that we may realize just prices for our fruit. If some member of this society will suggest a feasable plan of co-operation whereby we may get prices that will pay us for putting nothing but sound fruit on the market, he will immortalize himself and confer a lasting benefit on every fruit grower in Southwestern Iowa.

In conclusion I again commend for your careful consideration the faithfulness of our secretary. Give him a word of encouragement. We are all grown up boys, and with us as with the small boys, a word of cheer is ever appreciated, and especially when the compensation is not commensurate with the work required at our hands.

I take this opportunity to thank you all for the kindly patience and loyal support you have given me as your president for the past two years, and I ask each member to pledge, with me, like fidelity to him who shall take my place as our presiding officer.

SECRETARY'S REPORT.

BY W. M. BOMBERGER, HARLAN.

Prosperous years in the work are the result of favorable seasons and soil conditions, with proper care of trees and plants. General business prosperity is more dependent on artificial conditions. Most of it is under human control. There has been light orchard and average fruit crops two seasons. General business has been booming under favorable conditions. Connecting this with the freeze-out, enthusiasm is at a lower ebb in commercial lines. Yet general planting, that is along all lines, has advanced. Commercial fruit growing has, from such reasons, not the zeal in it that it should have for the best immediate good of orchards.

The loss of the hard winter has left a large acreage. Excessive moisture of the past two seasons has been an advantage, in that it has caused complete

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recuperation of trees that were low in vitality, though it has brought the disadvantage of an increased fungi and some kinds of insect pests.

Our great enemy, the codling moth, has been reduced in numbers. So now there is probably no more important subject than sanitation and spraying. The failure of crops has been an advantage and the orchards with increased vitality will readily pay good interest for the delay of returns.

Very few people realize the enormous crop of apples possible with present acreage. There is a likelihood that most growers will be caught unprepared in help, packages and means of handling their fruit. Facilities for temporary or permanent storage will be lacking and there will be an inability to get the fruit to market that will cause waste and loss.

The market problem can be helped if the fruit is sound, perfect, clean, without worms or scab or rust. Sanitation points to an easy solution of the market problem.

Most good apple crops this year came from orchards that were, as a rule, in grass, those running more to wood growth that were under culture and cropped light or not at all. This in a measure points to the fact that wet seasons, or in series of them, it is better to have a firm soil under the trees and have them in grass and clover; this will prevent too free a wood growth and soil wash. This is about the reverse of conditions needed in drouthy seasons when trees are producing fruit heavily and the highest culture is needed to help them mature the crop.

Replanting of the grape has been slow and meager since the disastrous winter. In every section of the district there is an annual shortage of fruit and good prices prevail. The last two seasons have brought leaf troubles in young vineyards and places them at a disadvantage. Spraying with Bordeaux is necessary this coming season in all young plantations. The two unfavorable seasons we have just passed through places an ample supply of grapes still further in the future. Grape-growing, like small fruit-growing, has a bright outlook.

Excepting the raspberry, small fruits, the past two seasons, have been benefited by the abundant moisture. Good prices have given great courage and fine profits to the rapidly increasing band of enthusiastic small fruit growers who are again developing the fruit interests of the district. May their number increase and yearly grow larger and their profits continue.

This society held its first summer meeting this season; it was measurably a success, being largely of a business character. Such meetings under the bending boughs of laden apple, peach and plum trees, among vineyards, small fruits, or among the summer or autumn flowers, have a fitness and propriety that is beyond all question to the interest of the organization and all its members. We welcome the summer meeting, and suggest its continuance.

ORCHARD NOTES.

BY W. GREENE, DAVENPORT.

The oldest tree in our orchard is a Red Siberian Crab. Two of these trees were planted in 1856. The top of one broke off last summer, so only one survives of the first effort at orcharding in Iowa. This orchard included such varieties as Early Harvest, Red June, Cooper, Porter, Yellow Bell-

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flower, Winesap, Pippin, Milam, Russet and other eastern sorts. A few of these trees had been top-worked in the nursery, about two feet from the ground, but the tops outgrew the stocks and broke off as the trees attained age. Among the first of these trees to die were Cooper, Early Harvest, Milam and Porter. The Pippin was the last tree removed and was about thirty years old, though it was not entirely dead at the time, but improvements on the place required its removal. The next planting was in 1861. A few of the Fameuse trees still survive in this orchard, It was strongly recommended at that time to head the trees low; as the result of this advice the trees in this orchard were headed about a foot from the ground, and the result was that when the trees became large and began to bear heavily they split near the ground under their load of fruit. It is difficult to maintain a central stem when the branches start so near the ground. Under such conditions the branches form a cluster of stem from a single root, like a shrub, which with age usually breaks apart. I would not advise heading any fruit trees except the peach with more than one stem. On the apple we would start the head from two to three feet from the ground; this height is more convenient for working the orchard and in caring for the trees while young, to prevent injury from rabbits, mice or borers.

The third orchard was planted in 1868. Of this orchard the Hawthornden, Fameuse, Cole's Quince, Romanstem and Benoni proved hardiest, The Fameuse has stood better on our soil than Duchess. The Red Astrachan, Duchess, Benoni and Red June went out when about thirty years old. This third orchard included nearly forty varieties, most of which were killed in the winter of 1883 and 1884. The Hawthornden—if that is its proper name (an apple much like the Maiden Blush, without the blush on the cheek, or very faintly so, and sometimes called White Maiden Blush), has stood the best. The objection to it, if any, is that the tree usually sets more fruit than it should, so that it is necessary to thin it if a large size is wanted. This criticism also applies to the Genet, and other varieties which set heavy crops on alternate years. If more attention was given to systematic thinning of fruit on the tree a more uniform crop of apples, of larger size, could be secured every season. Why do we neglect the orchard in this way when we could remedy it, when we know it must result disastrously both to size and market value of the fruit ?

The closer the competition the more care it requires to secure the best fruit for market. It is the quality of your product which will determine your place in the market. The man who goes into the market with the best fruit will always find a purchaser, however congested the market is, while the inferior grades will remain unsold.

Another suggestion I would like to make is that it will pay to pick the fruit from the tree as it matures. This is especially true of those varieties which mature their crop in warm weather, and that begins to drop early, like Fameuse and Grimes' Golden, etc. By picking over the trees two or three times you extend the season for doing the work as well as increase the quality of the fruit left for the later pickings. While this may require a little more labor to pick the fruit, it will be more uniform in its keeping qualities and give a higher excellence to your grade of fruit.

The ideal apple is still in the future and always will be. If any one could grow a good apple without special effort on his part the fruit would be so cheap that there would be no profit in raising it. It is the obstacles in

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the way of orcharding that gives the profit to those who do succeed in over coming them.

Chair appointed following committees:

On President's Address, Secretary's Address and Treasurer's Report: Messrs. D. L. Heinsheimer, S. W. Wilson and D. W. Lotspeich.

Committee of Fruit Awards: Messrs. F. P. Spencer, J. W. Murphy and Prof. A. T. Erwin.

Committee of Resolutions: Messrs. C. H. Deur, A. F. Collman, J. P. Jackson, J. F. Record and W. F. Laraway.

CENTRAL IOWA NOTES.

BY S. W. WILSON, WAUKEE.

This has been a poor fruit year in the Sixth District in general, but varying in localities. In some localities frost and wet weather did much more damage than in others. The spring opened up cold and wet. A late frost, not only a frost but a freeze, came when cherries and plums were in bloom or fruit already formed and apples just opening into bloom. It seemed almost impossible for a single bloom to survive, but some cherries, apples and plums in some localities did live through it. In Polk county, on the bluffs of the Des Moines and Coon river, apples are reported as 25 per cent; plums, Japan varieties, 25 per cent; domestic, 20 per cent; Americana, 10 per cent; cherry, 15 per cent; pear, a failure; strawberry, blackberry and raspberry, an average crop; currants and gooseberries, a failure; grapes, 50 per cent of a crop. The fruit of poor quality on account of too much moisture. Warren county, on the bluffs of the streams, is about the same as reported. Some very fine specimens of apples, pears and plums were shown at the county fair, also of peaches, including Champion and Bokara in named varieties. There were some fine specimens brought in, supposed to be seedlings, and I believe we will get something of value in some of the seedling peaches; some of them have been reported of the Elberta type that are claimed to be equal in hardiness to the Champion and are proving to be as hardy as the Bokara and a much larger peach.

Madison county reports a small crop of apples; also poor in quality; but very few salable apples. Plums a failure; also pears. Blackberries, raspberries and strawberries an average crop. Currants and gooseberries almost a failure. Grapes medium in quantity but poor in quality. No report as to spraying.

Dallas county has the nearest a failure in apples it has had for a number of years. Early apples making 65 per cent comparing with crops of past years—Duchess, Cole's Quince and Lowell doing the best. Fall apples, 40 per cent; winter apples, almost a failure. Plums and pears, a failure, except in some favored localities. Peaches, a fair crop—Champion, Bokara and seedlings leading. Cherries, a light crop and poor in quality. Strawberries, 75 per cent—the late varieties doing the best. Black raspberries, 75 per cent; red raspberries, 75 per cent. Currants and gooseberries, a failure. Grapes, 50 per cent—Concord the best, but fruit of poor quality.

I have but little to report as to spraying, as there was so much rain during the spraying season that it could not be made effectual. At some times

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it was badly needed, as leaf-blight and mildew were prevalent everywhere. Apple orchards show what I suppose might be termed the shot hole fungus, but I am not sure that this is correct; it also affected the apple trees in the nursery. Sometimes the foliage appeared as though it was almost ready to drop, while the foliage on cherries was covered with mildew—varieties of English Morello type were as bare as in the fall; Early Richmond and Montmorency not so bad. This same mildew affected the gooseberries in nursery row, and immediately checked the growth and the leaves fell. The reports were that the best method and most effective was spraying the cherries, and by spraying a number of times they saved the foliage and ripened the fruit. Use the Bordeau mixture. As to varieties I have nothing new to report in this district. About the same varieties in apples will be planted. In grapes the Worden seems to be growing in favor. In strawberries the list is entirely too long, and planters are confining themselves to standard varieties. You will notice that the Japan plum has the highest per cent and Americana the lowest. This is something unusual, and I do not want the members of this society to think by this report that it will pay to plant Japan plums in the sixth district for commercial purposes, for I do not think so. But this shows the peculiarity of the past season on the family of plums. Nursery stock made a poor growth the fore part of the season, but made it up later; but some stock, such as one year apples, have gone into winter quarters in rather a soft and immature condition, and at the sudden freeze showed some bark-bursting, and I will say where this is the case to any great extent it would be best to cut them back within two buds of the ground, or in other words leave two buds on new growth of this year, cutting below the bursted bark if possible, but if this cannot be done, it will heal over much better than not to cut back at all.

Potato crop in sixth district was light, but varied same as fruit in some localities. Fifty per cent of a crop is reported.

PROF. A. T. ERWIN: The apple stocks used are too tender, and it would be an advantage to the orchardist if seeds from apples grown here in the West were used for apple stocks.

A. F. COLLMAN: At the Minneapolis meeting this was discussed and they seemed to be of the opinion that on extreme tests the Duchess apple seedlings were as tender as any. But they advocate the planting of Duchess and Wealthy seedlings and grafting on them. I favor the use of the Virginia crab; it roots readily from the scion.

E. F. STEVENS: We noted in Nebraska that in test winters trees that were on their own roots were in many cases saved, and those that were not were completely killed.

PACKING APPLES.

BY F. P. SPENCER, RANDOLPH.

In the business of packing apples the first requisite is a good, light, well ventilated room, the larger the better, with strong smooth floor. Having the above next will come a sorting table and I find a canvass covered one

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the best, I mean by this a canvass about four feet wide stretched over a frame, length to be governed by amount of work to be accomplished. Four men can work at mine which is about eight feet long.

I have yet to see first class work done with a shute used by many, if there is any speed it is at the expense of quality, this is of course true with any method of sorting but emphatically so with shutes.

A good supply of barrels, all head lined, all hoops nailed on excepting the two at one end, would be the next requisite and should be prepared in advance, these in connection with good reliable experienced packers brings us to a point of readiness to receive the apples. Experience has taught me that any hard and fast rules governing packing apples cannot be made. As no two varieties need the same handling and crops of each season are vastly different in size, color, smoothness and freedom from worms. An apple packer ought to have some well settled idea as how best to pack his crop to show most satisfactory returns and along that line. I have always contended that to take the average pack, say of one hundred barrels and resort them—making seventy-five barrels—and they will bring more money than all of them together, leaving twenty-five barrels of indifferent stock, but yet of some value.

I hold to the idea that all apples are marketable that are not rotten, small or scabby (wind falls included) except summer and fall varieties and he who in this day of intelligent orcharding, raises any great amount of early apples, is beyond my reach.

My first move in packing, after fruit is on the table, is to instruct my men to make one grade of fancy apples; another of a fair, second quality, balance to be put in a bin especially prepared, to be sold to vinegar factories, and that uses up all the crop. In fact, my first instructions to my packers are to clean up the orchard as they go along of everything in the shape of an apple, except those that are rotten, then when we are through we *are* through.

This year, my Ben Davis, which was about the only variety that stood the May freeze, were somewhat under size and probably only about forty per cent would grade fancy, but such as did were good enough for anybody. This last statement I can prove by the party that bought them and he wants some more of my packing next year.

I think a good responsible man that is in position to command a large market for apples, is a mighty good man to tie to, provided all arrangments can be made mutually satisfactory. Like David Harum, I think it always a good plan to let the "other fellow" have some of the profits of a hoss trade.

Had intended to say something along the line of picking and hauling, but this article is long enough and will apply the brakes.

WESLEY GREENE: It is a mistake to pack apples while they are hot. The fruit should be cool. Heat causes the fruit to mature rapidly in the barrels.

JAMES MCGINNIS: To pick successfully in several pickings would be too much expense as we gather the fruit. The profits are not large, and farmers who gather the fruit would not do it. We buy of them and have to take the fruit as we get it, and

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deliver it to the retailer as quickly as we can. Our freights are entirely too high and our crops too small to permit of careful work.

E. F. STEVENS: In Western Nebraska the summer apples have given us better returns; we ship to one hundred or more good local points, to country merchants. We seek and get in direct trade at $2 to $2.50 per barrel.

W. M. BOMBERGER: Summer fruit, such as Duchess and Transparent, needs not only careful gathering, but it should stand a few days to toughen the skin by wilting; they will then handle much better.

A letter was read from Mrs. H. A. Terry, who on motion was made an honorary life member of the society.

SHELTER BELTS.

BY J. E. COLEMAN, FARRAGUT, IOWA.

In a climate like ours the question of shelter by artificial groves is one of vital importance to the farmers of this section of the West. They are not only of value in protecting the dumb brutes, but of value to the farm and are an ornament to the home. In the days of our pioneer fathers when the distance to nurseries was long and freight transportation slow and high in price, and the price of the land was very cheap, it would do to plant cottonwood, box-elder, willow and other deciduous trees. In those days the evergreen in price, was beyond the reach of the common citizens who were struggling to gain homes in the West. He was doing well to spare a day off to go to some creek or river bottom and pull cottonwood, willow, ash, or box-elder, where he could get them for the asking. But at the present day, with land at the price that it is, nurseries near on every hand, railroad facilities for transportation unsurpassed, and evergreens as cheap as they are, it is foolishness for the land owner to waste his valuable land in planting deciduous trees for shelter belts. For, when winter comes they are barren of their foliage at the very time when most needed. The only good and permanent shelter belt, that is a shelter belt, is the evergreen grove. It may be truly said that the evergreen grove is a Godsend to the barnyards of the cold climate, where winters are so severe and the winds so chilly and derogatory to live stock. For a permanent shelter belt, the evergreen is the only successful grove.

For a wind-break, prepare your soil by plowing and harrowing, have it well pulverized, plant four rows of evergreens running east and west. Set all rows hit and miss. Have the two north rows Scotch pine, Austrian pine or white pine, the latter is preferred, for it improves with age and in the winter has a dark green color that shows life and vigor. It grows very tall and makes a good wind-break. South of these two rows plant two rows of red cedar, for they are something that the stock will not bother and they are very bushy and compact, and make an excellent wind-break. The object in planting the cedars on the south, is that they are of much slower growth than the pines, and in that way both will receive the sun. Another objec

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is that the pines are more open at the bottom, not compact like the cedar. The pines should be planted sixteen, eighteen or twenty feet apart, and the cedars twelve, fourteen or sixteen feet apart. That may seem a long distance when they are small, but if you think it is too far apart, look at some grove that is twelve or fifteen years old, and measure the distance there. That will give you a correct idea of the distance to plant your trees. Now, a word about planting this grove, first get your ground in order, then some damp, cloudy day, when the wind is not blowing, when rubber boots are necessary, and you feel like taking a gum coat too, take you team and wagon, put about six inches of damp, wet chaff from the strawstack in the bottom of the wagon box and a few old carpets, saturate them well with water, then go to the nursery for your evergreens. Start early in the morning so you can have them planted before you close your eyes in sleep that night. When you get to the nursery don't let them put you off with some that have been dug for several days, or have been exposed to the sun, but go to the field where they grow and get live, healthy trees, not too large, twelve to eighteen inches is large enough. At the end of five years they will be as large as if you planted twenty-four or thirty-inch trees. The ground where you plant your grove, keep well cultivated, raise sweet corn or potatoes, or some crop that will require the ground to be cultivated. Blue grass is milk and honey to the hogs, cattle and horses; it is a velvet cushion for children to play on, and a beautiful blanket to cover the graves of our departed dead, but to a young orchard or a young grove it is death and destruction. It is just as foolish to plant a young evergreen grove among thick blue grass sod as it would be to plant corn or potatoes there. Cultivate your grove five or six years, then let it seed to grass. By that time your trees will be large enough to shade the ground, so that no grass sod will interfere with their growth.

Now, a few words about trimming evergreens. In my judgment never cut the lower limbs off your trees, let the limbs drop down to the ground, if they will, it only adds that much to your wind-break value. The way to trim evergreens is to have a pair of pruning shears and clip the ends of the limbs. By doing this the limbs become more bushy and compact, and make the tree better able to resist the wind and adds much to its beauty. When you get a shelter belt like the one described, you will have something that will add hundreds of dollars to the value of the farm and inestimable value for protection to the stock and the orchard, and an ornament that will attract the eye of the passer-by and make the farm nearer and dearer to the hearts in the home.

J. H. M. EDWARDS: Can plant effectively close in rows. It is possible that it may be right to plant in sod in some cases, but growth will be feeble and constant spading around the trees is necessary to keep up thrift.

A. F. COLLMAN: I did advocate planting Scotch pine, but recommend White Spruce more now.

E. B. GAY: Austrian is far better than Scotch, and it makes a fine tree with age.

L. A. WILLIAMS: Austrian pine leads with White pine a close second, but western Red Cedar is an excellent tree. I do not

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recommend Scotch pine or Balsam fir. Have had for many years all varieties under test, I have some fine American Arbor Vitæ.

D. L. HEINSHEIMER: Have had considerable experience with varieties, and would strongly advise against the planting of Norway spruce. It is a poor variety for this soil and locality. If the trees would only die outright it would be a relief. I have Austrian and White pine, Red cedar and American Arbor Vitæ. I have a beautiful hedge of Arbor Vitæ on my city property and it is a success.

J. H. M. EDWARDS: Austrian pine is fine, but while young it is a straggler, and does not look or sell well as a nursery tree. I like the Colorado Blue spruce.

WESLEY GREENE: Norway spruce needs shelter from the dry winds. When protected it does fairly well. I have seen some good specimens of considerable age in sheltered locations. The Scotch pine is good when young and for a nurse tree or temporary purposes I would plant it. White pine suffers from drouth in dry sections but when established it is the best pine to plant in the eastern part of the state. Douglas spruce, White spruce, Black Hills spruce are all excellent. American Arbor Vitæ makes a fine hedge, it does best in a moist sheltered location.

D. L. HEINSHEIMER: I have an Arbor Vitæ hedge here in Glenwood on my city property that is a marvel of beauty and a success on high ground but we have the shelter of the hills. Shade from some elms is the only thing that has injured any of it; only a small part of it. We keep it four feet high. Norway spruce is a decided failure in this locality.

L. A. WIILLAMS: Evergreens should not be planted near deciduous trees or vice versa, as they will injure each other by contact and overshading. I received a car load of evergreens once from Robert Douglas and out of it planted a large lot in a ravine that is well sheltered ; these trees throve and have been very beautiful near the water course and in a protected place.

W. M. BOMBERGER: All who have evergreens seem to be closely attached to them and like them.

JAMES MCGINNIS: In planting evergreens around an orchard, how near should they be planted to the trees?

A. F. COLLMAN: Not closer than thirty feet, but the best plan is to plant orchards large enough so as to protect themselves.

W. M. BOMBERGER: We believe in close planting of both evergreen groves and orchards, and in the removal of the nurse

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trees later. In the end all such planting survive the longest, it is nature's way. If you have not courage enough to remove a tree, tie a string around the tree to be cut out and hire it done while you go visiting. Use Scotch pine for nurse trees and at ten years use the ax freely and the branches for mulching strawberries, or anything else that needs protection.

(At this juncture considerable discussion took place on near or distant planting in orchards, summarized as follows:)

D. L. HEINSHEIMER: Close planting makes the best orchard up to a certain time then some of the trees need moving. If they are not removed at that time it is not the fault of the system. In my own orchard I can show you this fact, as well as in several sections of the great orchards planted by John Y. Stone. But we say the trees should be removed in sections or parts and not thinned to one half at once. In the drouth years, there the trees suffered less and were injured less by the test winter of 1884-5.

J. W. MURPHY: My place joins the John Y. Stone orchard and I have a part of it under lease and can testify to these facts also.

JAMES MCGINNIS: Close planting is not so good, this talk is all right for the professional, but won't work in general application, as most of the orchards are farm orchards and farmers will not thin out the trees, and it is best not to lead them into this mistake, they will not cut them out. The fruit is not so good or well flavored, the trees grow too upright, and culture is almost impossible in a closely planted orchard. Trees should not be planted closer than 27 by 32 feet.

W. M. BOMBERGER: It is a waste of time and ground not to get nurse trees into earliest bearing possible on this ground. It is easily done after the sixth year if one girdles them annually with a saw about the twelfth of June, after the "Dart Method." They can be girdled on the trunk or large limbs. Farther north I would do it ten days later, and farther south that much earlier, early fruiting varieties earlier, winter apples a few days later.

JAMES MCGINNIS: Orchards need a wind-break on west and south.

L. A. WILLIAMS: Close planting of orchards I think is and has been a mistake, it is too much additional draft on the soil.

E. B. GAY: I think farm orchards should be planted close. The rule is that if trees are 30 feet apart each way, it is a fact that a farmer will not take as good care of them as if they are

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planted closer and there are more on the ground; it looks more like business to him, and he will take better care of them.

PROFESSOR ERWIN: A wind-break could be used to better advantage than close planting.

J. W. MURPHY: I would plant close. If we plant any new orchard tracts we will plant close and thin at the right time.

E. F. STEVENS: Both methods have merit, close and distant planting. I planted a commercial orchard 14 by 20 feet and got more returns, while the orchard was young, 1,500 bushels per acre, a gain of 750 bushels on nurse trees.

A. F. COLLMAN: In the matter of utilizing of waste in orchard products, we lose by not grading properly. Any one can afford to make very low prices or throw away poor grades for a gain on firsts. There is a trade that will pay almost any price for fancy stock, then a uniform grade creates a reputation and makes future sales easy. I do not believe it pays to sell cull stock, would feed it to hogs or other stock.

L. A. WILLIAMS: Here the canning factory pays twenty cents per hundred for grades.

A. F. COLLMAN: That may do here, but many orchards are not near factories.

D. W. LOTSPIECH: Why not make vinegar?

D. L. HEINSHEIMER: That will not pay, as people by long usage have become accustomed to commercial vinegars made from other products than apples. I would say from a merchant's standpoint, that many prefer the spurious article to that which is pure.

A. F. COLLMAN: Cooperage is too high.

D. L. HEINSHEIMER: It will pay to make two grades just to protect your name and establish your reputation as an orchardist. I have requests for apples that are good without any reference to the cost, there is a considerable demand for that kind of an article.

JAMES MCGINNIS: That is so, yet there is a large amount of business done outside of the "fancies." The talk we are now giving is ideal. The average fruit is pretty good, and lots of business is done in common stock. It is worth looking after and taking care of. I advocate raising the grade from year to year. If you cut forty bushels down to ten and sell the ten, you practically give away the thirty bushels, that kind of business cannot be made to pay. "Fancies" are now $4 and high grades $3 per barrel.

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D. L. HEINSHEIMER: Those that make high-grade fruit a specialty keep their brands off of low-grade fruit.

F. P. SPENCER: No man can afford to spoil his reputation by a poor pack, but must build a reputation. Mr. Wellhouse tried the vinegar proposition and could not make it work. I think it would pay to only have apples graded into first-class fruits, and sell the grades by car lot at twenty to forty cents per hundred, loose in car.

W. M. BOMBERGER: Fairly good waste apples went out of Glenwood this year at fifty cents a hundred per car, sold loose.

PROF. A. T. ERWIN: We, as a state, are made the dumping ground for adulterated vinegars and foods of all kinds, and there should be some move made to get legislation against this dumping business.

REPORT OF COMMITTEE ON AWARDS.

Your committee reports that it has awarded the following premiums:
For best county exhibit:

Polk, first	$10.00
Monona, second	7.00
Mills, third	4.00

There was no individual display, or of seedlings.

On best plate of variety of apples:

Gano, Mr. Garrett, first; Fall Wine, Mr. Garrett, first; Grimes Golden, Mr. Gay, first; Grimes Golden, Mr. Garrett, second; Grimes Golden, Mr. Bordner, third; Wealthy, Mr. Garrett, first; Domine, Mr. Gay, first: Minkler, Mr. Garrett, first; Northwestern Greening, Mr. Gay, first; Northwestern Greening, Mr. Garrett, second; Northwestern Greening, Mr. Bordner, third: Wolf River, Mr. Garrett, first; Chenango, Mr. Garrett, first; Genet, Mr. Gay, third; Winesap, Mr. Bordner, first; Jonathan, Mr. Edwards, first; Maiden Blush, Mr. Garrett, first; Hubbardston, Mr. Garrett, first; Ben Davis, Mr. Garrett, first; Fulton, Mr. Garrett, first; Gawens, second; York Imperial, Mr. Peters, first; York Imperial, Mr. Gawens, second; York Imperial, Mr. Gay, third; Jonathan, Mr. Gay, second; Jonathan, Mr. Peters, third; Ben Davis, Mr. Gay, third; Willow Twig, Mr. Gay, first; Ben Davis, Mr. Peters, first; Janet, Mr. Bordner, first; Janet, Mr. Gay, second; Janet, Mr. Garrett, third; Stark, Mr. Gawens, first; Wagner, Mr. Garrett, first; Fallwater, Mr. Garrett, first; Mann, Mr. Peters, second; Mann, Mr. Garrett, first.

On cut flowers, Mr. Bomberger, first.

E. P. SPENCER,
J. W. MURPHY,
A. T. ERWIN,
Committee.

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LIQUID SPRAYING.

BY F. P. SPENCER, RANDOLPH.

The powers that be in assigning me this subject and others must have known that my belief is that there is but one method of spraying and that is with liquid, but out of deference to the fellow who believes in raising a dust when he does anything in the way of spraying, I have, as you will observe, headed my article so as to give him a chance.

I have sprayed more or less for three seasons and confess am not ready to say I believe it an unqualified success, on the other hand do not desire to be quoted as one that thinks spraying a failure, but will say, I fully intend to spray once before buds open and two or three times afterward, if prospects are encouraging.

First spraying will be with Bordeaux mixture only and subsequent ones adding Paris green at the rate of one pound to one hundred and fifty gallons, at all times using all the milk of lime that can be forced through fine nozzles without clogging, adhering to the formula as to amount of blue vitriol.

While this may all be labor and materials thrown away, I do it with a hope that some poor insect may be induced to partake of it and go hence. At any rate as long as my orchard produces better apples, less infested with worms, with better color and trees apparently more vigorous than those that are not sprayed, shall continue to spray.

J. P. JACKSON: We sprayed last year until we got rained out.

D. B. MCCALLA: Two years ago I sprayed three times and had 85 per cent clean apples, this year only sprayed once and got rained out and only 40 per cent of fruit clear of worms.

F. P. SPENCER: If a little time after spraying is possible for the mist to set and dry on the trees, rains do not wash it off so much, it makes considerable difference.

D. B. MCCALLA: I think Bordeaux mixture will stick two weeks. I know it sticks on harness and about all else, our outfit looks as if painted after operating it.

W. M. BOMBERGER: This is what led to its use. In Bordeaux, France, a vineyardist was bothered with thieving in his vineyard, along a highway, he sprayed this mixture on the vines to give them a dangerous appearance, then posted signs that poison was placed on the vines; this was to keep out thieves; but afterward it was found the foliage and fruit was immune from the prevailing diseases of that locality.

F. P. SPENCER: Tests show that Paris green is purest and London purple is more or less adulterated.

Paris green is, if of a standard strength and purity, preferred to the London purple, but white arsenic solu-

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tion is stronger and better. It is a chemical mixture and does not settle as Paris green, which needs constant agitation to keep up a perfect mixture. In Oregon it is used extensively and I here present the formula authorized by the State Board of Horticulture of that state: Commercial white arsenic, one pound; carbonate soda, four pounds; water, two gallons. One and one-half pints of this to fifty gallons of Bordeaux mixture.

Directions:—Dissolve one pound commercial white arsenic, and four pounds of carbonate soda in two gallons of water. Use one and one-half pints to fifty gallons Bordeaux mixture.

Easiest way to make the solution is to put both the white arsenic and carbonate of soda in a gallon of boiling water and keep boiling fifteen minutes, or until a clear liquid is formed, then dilute to two gallons. One and one-half pints should be added to each fifty gallons of Bordeaux. Full strength for earlier sprayings, and moderate Bordeaux for late sprayings, increasing the arsenate solution from one and one-half pints, to one quart as the season advances in foliage mixtures. If used without Bordeaux or lime it is liable to burn foliage. As there is nearly always fungi to contend with it is recommended that the two sprays be combined with advantage. The combined poison sticks longer than if used singly. Unless combined with Bordeaux it is very important to use fresh slaked lime to insure complete decomposition of arsenate of soda and formation of arsenate of lime. Use six to eight pounds of fresh slaked lime to a barrel of water.

J. H. MURPHY: We are not as far to the front, at Glenwood, as we ought to be, some here even combat the idea of spraying at all. But we can show that those that sprayed have clean fruit. We think it should, as a rule, be kept up later than it is. I started and pushed the work with three outfits last spring, but got frozen out as well as rained out later from doing as good work as we might have done.

PROF. A. T. ERWIN: The Oregon formula has been found excellent at the college, and we tried a mixture that is patented called Disparine that is still better, but it costs more. The last has a gummy consistency to it when in solution and sticks to foliage better, and it seems to be more effective.

E. F. STEVENS: When apples are few and in off years, that is the time to get in the most effective work; it rids up the few remnants.

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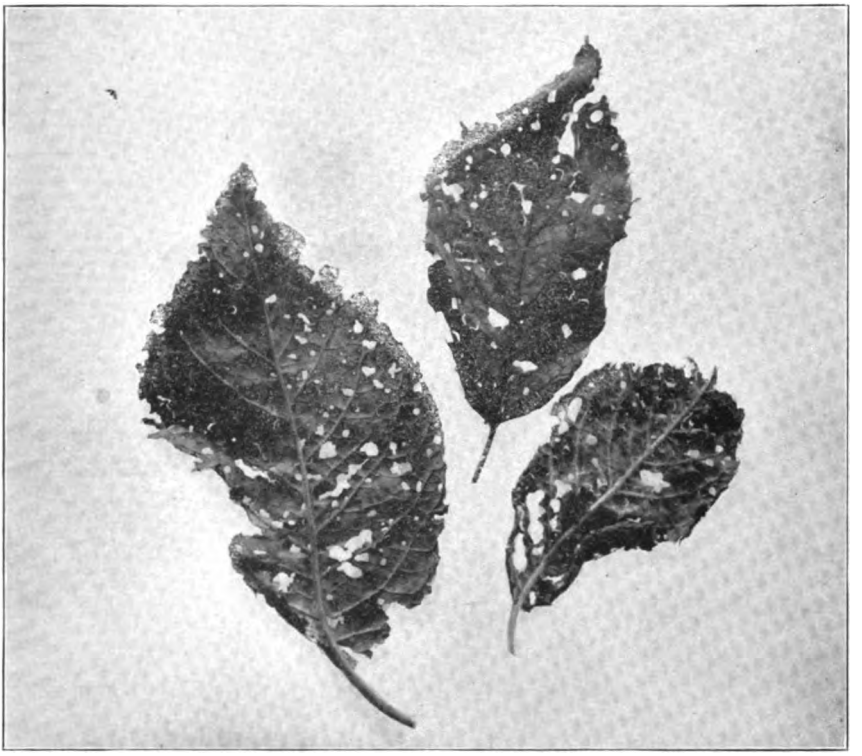

Shot hole fungus (*Cylindrosporium Padi*) on plum. For treatment use Bordeaux Mixture.
Photograph by Charlotte M. King.

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L. A. WILLIAMS: I have sprayed, have repeated it and advocated it, but I find little advantage in it. I do not speak hastily for I have made long trial of it.

J. W. MURPHY: Think we will win if we are constant.

J. P. JACKSON: Some here are discouraged, not working so heartily as they might, but we know they will win. I would like to hear from Mr. Laraway.

W. F. LARAWAY: We have sprayed successfully. Of late the crop was light, yet we found but very few wormy apples. It seems that worms damaged the fruit later than usual this year. All the damage we had was from late operations of worms. I sold my fruit without culling it. What called my attention to especial value of spraying this year was an incident on my place. A neighbor has a half acre cut in one corner of my orchard of sixty acres. There is a fine row of Jonathan on his land just next to my fence. When we sprayed our trees we just let the spray continue on his row of trees on the side next to my place. This half row in fall was hanging full of nice Jonathans, and the other side of the row bore a light crop of gnarly, wormy and imperfect specimens. This was to me a most conclusive proof of the value of spraying.

E. F. STEPHENS: In Colorado they band trees.

F. P. SPENCER: Think it would cost too much and that spraying is cheaper.

E. B. GAY: Think it would pay and we can afford to do it.

E. F. STEPHENS: It would cost Mr. Spencer $30 a year on forty acres.

JAMES MCGINNIS: Codling moth worked hard this year after the spraying season was over; borers were very severe also this season. They have put us on the lookout.

E. F. STEPHENS: Veneering is used extensively against the borer in Missouri, without damage to trees. L. A. Goodman has them in use on extensive tracts planted to orchards.

H. A. DRAKE: Disparine killed the borer last year by placing it on the bodies of trees.

JAMES MCGINNIS: Woodpeckers and sapsuckers do their duty but we must help them out.

E. F. STEPHENS: Alkaline solutions are effective on trunks of trees; veneers as an artificial protection.

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The election of officers resulted as follows:

C. H. Deur, President; F. P. Spencer, Vice President; W. M. Bomberger, Secretary; J. P. Jackson, Treasurer.

Directors: D. B. McCalla, first district; A. F. Collman, second district and third district; J. H. M. Edwards, fourth district; James McGinnis, fifth district; S. W. Wilson, sixth district.

JAMES MCGINNIS: There is an inclination to leave fruit on the trees too late. This is so with Grimes and Jonathan; they do not keep so well. I incline to the idea of picking two weeks before barreling, put in cellar not over four feet deep, or any good cool place will do, out of the sun. I do not favor putting apples in barrels as soon as picked. When we get a market we barrel them.

F. P. SPENCER: Cold storage men want them barreled at once; if they know they have been lying unpacked they do not want them.

JAMES MCGINNIS: We do not sell to storage men but to small dealers. I ship a good many loose in car. The idea of Eastern apples being best is somewhat of a fad. Apples of the West can be graded to just as high a standard; many Eastern grades are not as good as Western, but the name sells them. What we want is decent freight rates, as the tariffs are so high we cannot compete with Eastern dealers, and will have to let much of our fruit rot unless there is a change in rates.

J. W. MURPHY: We cannot handle our apples here at Glenwood as Mr. McGinnis does. We have to handle for storage and storage men. The facing must be just the same as the whole barrels. Two years ago fancy Jonathan brought as high as $12 per barrel. No. 2, $5 to $6. $2.50 for No. 3. Our good apples, strictly fancy grades go West.

W. M. BOMBERGER: In following up this discussion it is plain that there is an outlet and a place for all classes of apples, and each has a market. The only difference is as to who furnishes the supply, and the methods of doing the work, prices sought and secured.

On motion a summer meeting was ordered held at Council Bluffs in 1904. The time of holding same was referred to the executive committee to fix the date.

On motion the next annual meeting was ordered held at Harlan. The second evening the city of Glenwood and the management of the State Institution provided a delightful entertainment for the society. This was followed by speeches, toasts, and a general good time, lead by Shirley Gillilland.

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THURSDAY MORNING SESSION.

PACKING APPLES.

F. P. SPENCER: Use a heavy canvass table drawn over stakes set firmly in the ground, stakes made of 2 by 4 lumber. Four men work around the table. Lift the apples direct by hand from table to barrel, standing beside each man. They are put in carefully and the leg is used against the barrel to shake and settle the apples while filling it. Apples are handled singly and in pairs. It is better to hire the grading done, as it is a disinterested grade then. We do not doubleface, aim to have every facing specimen perfect, other fruit in barrel as uniform as possible. Our packing house is two miles distant from orchard. We use springs on our wagon bolsters and have a system of boxes 11½ by 11½ by 23½ inches long, so as to set in wagon box cross ways. Place a double layer of these boxes on each wagon. We pick in orchard in candy pails with swivel and hook on bales, pour into boxes. We have a large nunber of boxes, plenty of empties to keep force going It is best to pack in a shed or packing house, rains interfere out of a building. Have a dry place for short time storage.

MR. TROUT: I use a method of grading of my own that works well. Grade into first, second and third. Then take firsts and divide them in large size and small, and sell the large size to fruit stand men who want size and perfection at most any price.

J. H. M. EDWARDS: Quite a little pressure is made to secure more just fruit rates.

On motion the president was authorized to appoint a committee. The following gentlemen were named to act on such committee: D. L. Heinsheimer, Glenwood; J. P. Hess, Council Bluffs; W. M. Bomberger, Harlan, to present the matter for a reduction of freight rates on a more equitable basis, to traffic managers of the several systems of Western railroads.

D. L. HEINSHEIMER: I think this is a good move. I have had some direct conference with this class of business men, and we find that they are always a fair-minded and just-dealing class of men. Of course in looking after large interests they are guarded in their acts, but are always ready to deal justly and all they wish to know are the correct facts in the case.

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W. M. BOMBERGER: It would only be a question of showing the facts of the annual loss of freights, shut out by high tariffs. I am glad to note the name of J. P. Hess who is a member of the Council Bluffs Grape Growers Association, as well as of the Commercial Club of that city.

D. L. HEINSHEIMER: I think this matter is only a cold blooded proposition of business and the matter needs only to be presented to them, showing their and our mutual loss.

SILAS WILSON: We have struck the right line of work here. The Burlington route is progressive, a broad-gauged route and a good road. All we need to show is the loss of traffic to the road. Other routes are interested also. This move is one in the right direction.

COLD STORAGE OR OTHER MEANS OF KEEPING APPLES.

D. L. HEINSHEIMER: We are at a loss for lack of storage here at Glenwood, having none it causes loss. When packers are at work and teams file in loaded with fruit, and long lines of wagons stand awaiting their turn to unload, there is a likelihood of low prices and buyers have it their way. A cold storage house here would mean much to this community, and should be provided.

F. P. SPENCER: Apples vary in keeping qualities. All do not keep alike under the same temperature. This is shown where a general cold storage is provided for wholesale lots. Jonathan will stand up well but Grimes is not a cold storage apple. Caves in the earth are a good natural storage place for apples. These are available to all. I tried some experiments in cave storage this year and made it a success. Apples were wrapped and placed in boxes.

D. L. HEINSHEIMER: I have a large cave, the entrance of which is made by passageway from under the house, but we are not satisfied with the ventilation.

F. P. SPENCER: Select a north exposure, brick it, ventilate with large tile running out some distance to change air. Scientific principles will direct one how to use the ventilation to keep proper temperature and humidity.

J. H. M. EDWARDS: I have used such in wintering bees for some years and apples also, we have kept Jonathan until July.

SILAS WILSON: Mr. Spencer describes an ideal cave; we have such for home use not on a large scale; it is satisfactory.

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A. F. COLLMAN: We use house cellar storage, 22 by 20 feet; keep the temperature uniform by means of ventilators, including outside ventilators.

F. P. SPENCER: We have our plans for an 80-foot cave 12 feet wide, on hilly ground, for this coming season.

J. F. RICARD: The side hill cave I have is well known and it is in my orchard and is a great paying investment, especially in the care and temporary storage of summer and fall apples. The temperature is very uniform. We drive a wagon in and have double wall entrance. This is a hill-side cave made by removal of earth into the hollow, and structure made with logs, heavy timber cut on premises.

W. M. BOMBERGER: We are possibly on the eve of some heavy apple crops and there is no possibility of properly handling it if some means of storage is not at hand. Those who have been waiting long for crops will not put much expense in a permanent cave. It would be well where labor can be used cheaply in summer, to use teams and scrapers to cut out temporary caves in hill sides. They need not necessarily be bricked up at once but can be covered with temporary roofing out of timber and a large amount of straw, hay or fodder placed on heavily enough to keep out rains and frost. The front can be double walled with air space between and is kept safe by adding manure covering later on as it grows cold and freezing weather stops outside work. The temporary character can be changed later as it pays out of the apple crops. Mr. Ricard's cave suggests this.

F. P. SPENCER: A permanent structure is best.

STRAWBERRY PLANTING AND CULTURE.

BY W. E. BORDNER, ONAWA.

From the previous speaker and the discussion we have the opportunity of learning how to prepare our ground. The next step is to have good plants, these plants I like to heal in a partially shaded bed, where I can spray them once or twice with Bordeaux. If there is any presence of insects on the plants I would add arsenate of lead or Paris green to the Bordeaux, at the rate of three pounds arsenate of lead to 150 gallons of Bordeaux, or Paris green one pound to 200 gallons of Bordeaux. These sprayings should be given once in the bed and again soon after setting, should occasion demand it. The Bordeaux is sure death to all spores which would in time

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develop into rust, blight or other fungus diseases. While the poison will kill any insects that may be upon your newly set plants.

There are many ways and various distances to plant strawberries; probably three-fourths of all the strawberries are grown by the full-matted row system, the plants are set three-and-one-half to four feet between rows and from eighteen to twenty-four inches in the rows. Now run the cultivator frequently, always going in the same direction, so as to throw the runners around without tangling them, and as they root narrow up the cultivator. My objection to the full matted row is that when the row is full a strip of ground some twenty inches wide is left around the plants, which cannot be cultivated. The crust forms over this, excluding the air from the roots and soil. The water does not readily draw up to the surface, hence, the roots dry and are injured. When the surface is thus dry, the runners will not send down their roots, but continue to live on the parent plant, oftentimes forming several plants on the same runner, which will blow around in the wind and do not take root until after late rains or perhaps not at all. Such plants cannot produce fine fruit of full size and maturity.

The best method I have used, all things considered, is the half-matted row system. Lay off your field into rows three to three and one-half feet apart, and set the plants sixteen to twenty inches in the rows, according to the variety and fertility of your soil; cultivate frequently, and keep all runners off until about the first of July, when the plant will be well established; then let the runners start and form a row one foot wide. After this use the roller runner cutter, attached to the cultivator, and clip off all runners as fast as they appear beyond the row one foot wide. This gives a beautiful row of plants by fall.

Setting Plants.—This work may be done in many ways, and with various tools. The great point is to have the roots straight and separated from each other; then imbedded in soft mellow earth, so that the new feeding roots which have just started while your plants were healed in, can start out in every direction without any hindrance, thus securing a vigorous growth at once. Great care should be used in setting every plant just right, for if set too deep the crown will rot or make a feeble growth. If too high, the upper roots will be exposed to wind and die. The new roots always start from above the old ones, and if the plant is not in the ground deep enough, they will not start; if a little too deep, new crowns will not start on the side of the plant, and if a little too high, will only make a feeble growth.

I have used with good results the perfection plant setter on some soils. But should there be any litter or stones in the soil it is a worthless tool. The spade is quite generally used and when in the hands of a careful man is the best tool I know of.

I have used and seen others use to good advantage the Planet Jr. horse cultivator for making the rows and using the large shovel for opening the furrows for the plants at one crossing of the field. The setter following closely behind the cultivator and with his right hand making a cone in the open furrow, at the same time the left hand is preparing the plant by taking it by the crown and holding the root upside down, giving it a slight quick jerk the roots will fall over the hand, when you can quickly turn it over the cone and the roots will arrange themselves evenly about it. Then the dirt is quickly brushed over the roots. It is very necessary to keep the earth

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loose around the plants after setting by frequently cultivating that capillary action will bring the water up above the roots and collect it under the loose earth or dust mulch and nourishes the plant during the trying ordeal of transplanting. The cultivator should be worked twice each week if possible among newly set plants, thus making the plants grow rapidly and killing the weeds before they get strong roots. Cultivate very shallow close to the plants, because the new roots come out of the crown above the old ones and very near to the surface and these new roots must not be broken.

The cultivation may be given the plants by most any cultivator, but I use the Planet Jr. 5 and 12-tooth as I consider them the best. Starting the 12-tooth cultivator the hour the plants are set, and continue frequent cultivating with the 5-shovel cultivator until about the first of October.

Spraying Strawberries.—This should be done whenever occasion demands either for insects or fungus diseases. I speak of spraying here, because we consider it a part of cultivation and yearly practice it. We use the arsenate of lead in preference to Paris green as it will adhere to the plants through prolonged rains and never burns the foliage like Paris green when applied by a poor sprayer or careless workman. We use the Bordeaux to kill the spores which so often develop into rust, blight or other dangerous diseases.

We cover all plants with straw or fodder with the first freezing weather.

TREASURER'S REPORT.

FOR THE YEAR ENDING DECEMBER 15, 1903.

December 18, 1902, received from O. H. Barnhill, Clarinda	$ 20.22
December 18, 1902, improvement association	20.00
December 18, 1902, Membership fees	27.00
January 9, 1903, draft from state treasurer	200 00
Total	$267.22

DISBURSEMENTS.

December 18, 1902, A. T. Erwin, expense to southwestern Iowa meeting	$ 10.20
December 18, 1902, O. H. Barnhill, expense treasurer	4.70
December 18, 1902, James McGinnis, expense director	7.25
December 18, 1902, R. L. Wilson, premium flowers	3.50
December 18, 1902, J. H. M. Edwards, premiums	.40
December 18, 1902, F. P. Spencer, premiums	1.20
December 18. 1902, A. F. Collman, expense director	5.70
January 19, 1903, W. M. Bomberger, expense secretary	14.55
January 19, 1903, J. H. M. Edwards, expense president	13.70
January 20, 1903, C. H. Deur, expense director	10.94
January 26, 1903, Henry Field, premium	1.00
January 26, 1903, J. H. M. Edwards, expense to Nebraska state meeting as delegate	5.60

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January 26, 1903, J. B. Laughlin, premium	.40
January 26, 1903, J. A. Latimer, premium	.40
January 27, 1903, J. P. Jackson and G. W. Gawens, premium	31.50
January 21, 1903, W. M. Bomberger, salary, 1902	100 00
September 17, 1903, C. H. Duer, expense summer meeting	1.80
September 17, 1903, J. H. M. Edwards, expense summer meeting	4.20
September 17, 1903, F. P. Spencer, expense summer meeting	4.00
September 17, A. F. Collman, expense summer meeting	4.00
September 17, W. M. Bomberger, expense summer meeting	8.00
September 17, J. P. Jackson, expense summer meeting	2.50
Total	$235.64
Balance on hand	31.68
Total	$267.22

REPORT OF COMMITTEE ON RESOLUTIONS.

Your Committee on Resolutions respectfully report the following:

Resolved, The members of the Southwestern Horticultural Society extend our sincere thanks to the officers of this society who have been untiring in their efforts in making this meeting a success.

Resolved, The society extend to the family of Dr. F. M. Powell our heartfelt sympathy in their bereavement. We have lost one of our most valuable members of this society, and the state and nation one of its best citizens.

Resolved, The members of this society co-operate with all fruit growers in the effort to secure lower freight rates on shipments of apples and other fruits. The present rates are driving growers into other lines of business. That the officers of this society appoint a committee for such work.

Resolved, The members of this society express to Dr. G. Mogridge and faculty of the state institution our appreciation of the splendid entertainment given us.

Resolved, The members of our society fully appreciate the courtesy shown us by the press and citizens of Glenwood generally.

A. F. COLLMAN,
J. F. RICARD,
J. P. JACKSON,
C. H. DEUR,
W. T. LARAWAY,
Committee.

REPORT OF COMMITTEE ON OFFICERS.

We, the Committee on the President's address, report as follows:

That we heartily commend his address to the association, especially that in which he refers to co-operation, which if followed and adopted by the association would be of great benefit in many respects, particularly wherein it would be possible to obtain lower rates in shipping. Also advance better

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methods in selecting and packing fruits, which would largely advance the reputation of Iowa fruit industry.

We also approve the good words said in favor of our secretary, who has faithfully performed his work for a comparatively small compensation, and who is entitled to the thanks of the association.

Also have examined secretary's and treasurer's report which we find correct.

But would recommend that somewhat better system should be adopted than heretofore by the past treasurer, especially in giving and entering in detail all membership dues received.

D. L. HEINSHEIMER,
D. W. LOTSPIECH,
S. W. WILSON,
Committee.

A business session of the officers and directors closed up the business of the society for the year. Adjournment was ordered to meet in summer meeting in Council Bluffs, Iowa, at a date to be fixed by executive officers, and for next annual meeting to be held December 13, 14, 15, 1904, at Harlan, Iowa.

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ADDITIONAL NOTES AND PAPERS.

Papers that were read before the State Society and not received in time to appear in their proper place in the proceedings are included under this heading.

FUNGUS DISEASES OF PLANTS AND THEIR REMEDIES.

BY PROF. L. H. PAMMEL.—AMES.

Mr President and members of the Iowa State Horticultural Society:

It affords me great pleasure to address you this evening on the Fungus Diseases of Plants and their Remedies. The question of fungus diseases of plants is one of great interest to every one engaged in the business of horticulture. I shall throw upon the screen this evening some of the more important diseases of plants and make suggestions as to their treatment, taking first of all some of the diseases of the cherry,

The past season has been especially favorable for the well known disease of the cherry known as the spot disease of the cherry, *Cylindrosporium Padi*, and incorrectly called rust. This disease was quite fully discussed by the writer in Bulletin 13 of the Iowa Agricultural Experiment Station. The disease is easily recognized by the rusty spots appearing upon the leaf of the cherry. On the under surface of the leaf there are little flakes of a whitish substance that clings or holds together. These flakes consist of a large number of spores that are the active agents in spreading the disease. The fungus has three stages. The stage with the perfect spores is produced in the spring in rotting leaves. In these perfect spores the spores are borne in sacs known as asci. The ascospores germinate and cause the infection of the young cherry leaves. When the conditions are favorable infection takes place in a very short time and proceeds from leaf to leaf. During the seasons of 1902 and 1903 the disease made its appearance during the later part of May and continued the entire season. The disease was so severe that in many cases the cherry trees were defoliated.

It is not uncommon to find this upon the pedicel or stalk of the cherry in this state. Mr. F. C. Stewart, of the Geneva, New York, Agricultural Experiment Station, has called attention to the importance of this form of the disease.

The Mildew of the Cherry (*Podosphæra oxyacanthæ*) is another prevalent disease. This, however, was not so severe as it had been on previous seasons. It is a well known fact that the powdry mildews are more severe during conditions of medium moisture than too much moisture. This disease is characterized by the production of a powdery substance on

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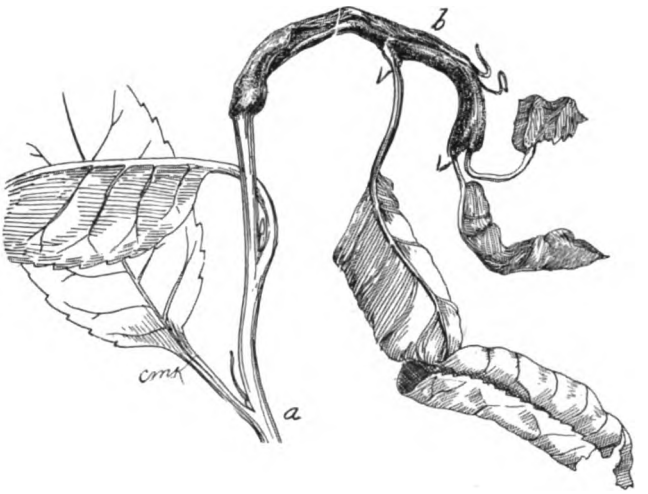

Fig. 1.

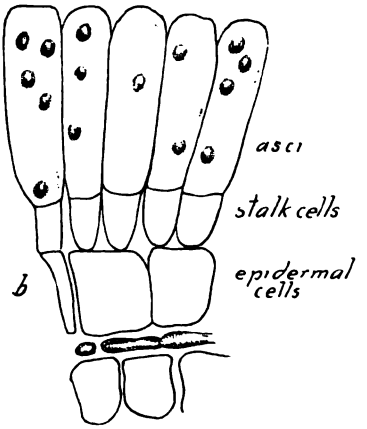

Fig. 2.

Fig. 1. The young shoot of cultivated American plum showing the enlarged branch due to plum curl (*Exoascus communis*) *a* normal size of branch, *b* enlarged portion of branch.

Fig. 2. Plum curl (*Exoascus communis*) on American plum. The spores (ascospores) in small sacs (asci), the stalk cells and the epidermal cells below, the mycelium (vegetative threads) between the cells.

Charlotte M. King.

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both the upper and lower surface of the leaf and in cherry trees it causes the leaves of the young shoots to curl. Both of these diseases are prevented by treating with Bordeaux mixture, which is one of the best fungicides that has yet been in use in the nursery or orchard. Bordeaux mixture is prepared in the following way and I am using the formula given in the spray calendar issued by the Iowa Agricultural Experiment Station:

"BORDEAUX MIXTURE."

Copper Sulphate..... 4 lbs.
Quick Lime.....4 lbs.
Water (1 barrel) .....40–50 gals.

"Dissolve the copper sulphate (bluestone) by suspending it in a wooden or earthen vessel containing four or five gallons of water. Slake the lime in another vessel. If the lime, when slaked, is lumpy or granulated, it should be strained through coarse sacking or a fine sieve. Pour the copper sulphate solution into the barrel, or it may be dissolved in this in the first place; half fill the barrel with water, add the slaked lime; fill the barrel with the water and stir thoroughly. Never add the lime until ready for use.

"Stock solutions of dissolved copper sulphate and of lime may be be prepared and kept in *separate* covered barrels throughout the spraying season. The quantities of bluestone, lime and water should be carefully noted."

Now; a second method of treatment and one that is quite important, is the hygienic method. It is important to remove all of the rubbish around the trees in the fall, and to remove all of the dead leaves that contain the fungus.

During the past season the writer was especially struck by this fact, that orchards, and commercial orchards especially, in which there had been considerable of the disease during the last two seasons, was more severely attacked than trees in private yards where there were but two or three trees. The same variety in the orchard in the vicinity of Ames, was severely affected, while the same tree in our own yard did not show any of the disease.

Several other diseases are quite commonly found upon the cherry, namely, a rot, *Monilia fructigena*, which is common also on other fruits, and was especially severe this year because of the very large amount of the disease the previous season and the conditions favorable for its progress the past season. Much may also be done in the destruction of this disease in the practice of hygienic treatment, that is to say, by destroying the mummied plums in the Fall, much may be done in the way of removal of this disease.

Another disease that the writer has found upon the cherry is found upon the plum, *Cladosporium carpophilum*, or as it was at one time proposed to call it *Cladosporium pruniculum* by Mr. Ellis of Newfield, New Jersey. It appears to me, however, to be nothing more than the Cladosporium occuring upon the peach. This disease produces the olive-green patches, causing the cherries to develop poorly, often becoming gnarly and in some cases the fruit cracking.

The plum is also subject to quite a number of fungus diseases, among the more important I may mention the plum-rot, *Monilia fructigena*. The

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powdery mildew is identical with the one occuring upon the cherry or very closely related to it, and need not be considered in this connection, as it is not nearly so destructive to the plum as to the cherry. The spot disease of the cherry, likewise occurs upon the cultivated plum, frequently producing what is called the gun-shot injury, which is rather rare on the cherry. This form of the disease was studied some years ago by Dr. J. C. Arthur, while connected with the Geneva, New York Experiment Statian. The remedy is the same as for the cherry.

One of the interesting diseases occurring upon the plum is the bladder plum, *Exoascus pruni* and *E. mirabilis*, which were discussed from an econonment standpoint by Professor Atkinson of the Geneva, New York Experiment Station, and other writers upon mycological subjects. Those who are interested in looking up this question will find in this report of Atkinson's a detailed account of the structure of the fungus. (Bull 73 Cornell Agrl. Exp. Sta.) However, it may be of interest to refer to it as follows. In large plums so commonly found upon the wild Americana plum, is brought about through the action of the fungus that makes its way into the young ovary and there develops a mycelium, which causes the unusual enlargement of the ovary, producing the bladder plums. The mycelium grows toward the outside and develops between the cuticle and the cell wall, elongated cells, the asci, these contain the spores. When mature a powdery, mealy substance is produced on the surface. Another species of this fungus (*E mirabilis*) shown in the picture, has the end of the twig enlarged. Its development is very much the same. I shall not in this connection touch upon this disease. One species occurs upon the elm, another upon the cultivated cherry, producing the so-called witches' brooms; another upon the alder; another one producing witches' brooms in the birch of the west. All of these are interesting not only from a horticultural standpoint but from the standpoint of forestry, this being especially true of the forms that occur upon the forest trees.

Another most interesting fungus found in connection with our wild plum, *Prunus Americana* is the black knot, a disease well known to American mycological writers for a great many years, but first worked out very thoroughly by Dr. Farlow, of Harvard University. You are no doubt familiar with the black and warty excresences so common upon the wild plum, indeed, very common upon the Japanese plum and *Prunus domestica* of Europe. The warty excresences in the spring of the year contain the asci with their ascospores. These ascospores germinate and develop a mycelium which penetrates the delicate tissue of the growing twig and there produces an enlargement consisting of the tissue of the heart and the vegetative threads of the fungus on the surface becomes olive green. The summer spores are found in this olive green mass. The only remedy to prevent this disease is to cut back the plant far enough to remove all of the infected tissues. If this is done carefully and methodically the disease can be exterminated. The writer has often observed that the infection results from neighboring infected trees. The writer observed several years ago that one badly infested tree in his yard transmitted the disease to all the trees in his garden. On the removal of this infected tree there was no further trouble from the disease. It is a rather strange fact that although this disease is very common upon

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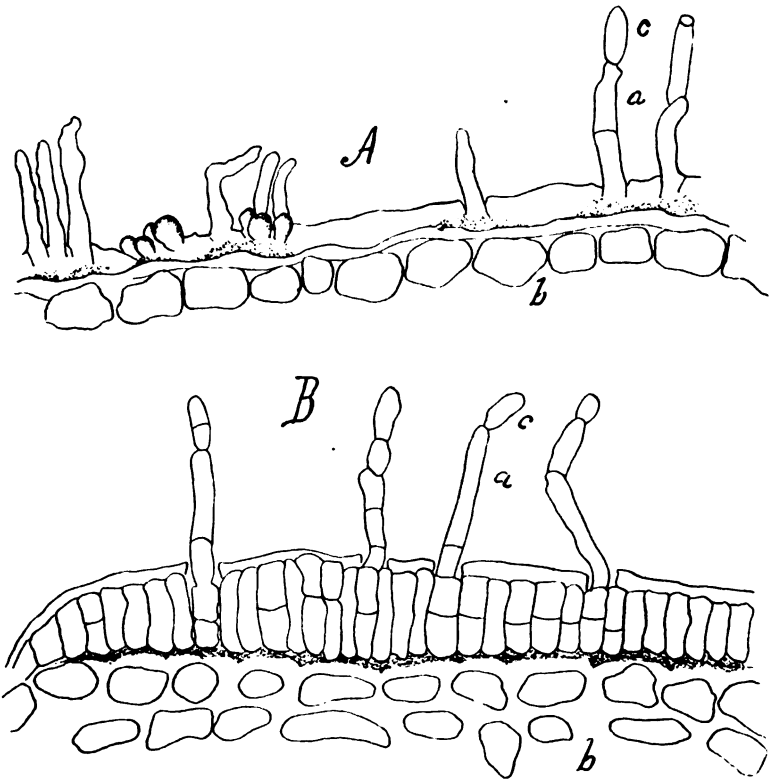

Two sections through spot showing plum scab. The upper, A during Autumn when the plums were fresh The conidiophores at *a* and *c* shown. B. a section of the plum scab after the same had been kept for some time in a moist chamber on sand. The elongated basal cells of the fungus shown at *l*, the cell wall of the epidermis above, the parenchyma cells of the plum below. *c* conidia. *a* conidiophore.

By L. H. Pammel.

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the wild *Prunus Americana*, the choke cherry and the black cherry, and cultivated *Prunus domestica*, it is never found upon the *Prunus Americana* under cultivation. In the eastern states it is very common upon the sour cherry, *Prunus cerasus*. It is indeed a most troublesome parasite.

Another disease to which I have given some attention is plum scab. This disease is not unlike apple scab. In its action on plums it is very similar to the peach scab so common upon peaches. It produces upon the surface of the plum a small spot with radiating fungus threads. The growth of the fungus below the cuticle causes a cracking of the tissues and frequently a cracking of the plums themselves, permitting the plum rot to make its way into the tissues and making it worthless for market purposes.

Now of the fungus diseases of the apple the past season has been favorable for apple scab and apple blight. The apple scab fungus, *Fusicladium dendriticum*, is easily recognized by the gnarly fruit and the small olive green patches that occur upon the surface of the fruit. The scabiness is due to the growth of corkey tissue that is formed as a result of injury to the fruit. This fungus produces its mycelium underneath the cuticle where it produces a short layer of cells. These send up erect hyphae that bear the spores.

Apple scab can be largely prevented by treating with Bordeaux mixture. It is a curious fact in connection with this desease that the fungus is somewhat sporadic. During the past season while there has been a great deal of scabby fruit, the apples from eastern New York have been unsually free. This is largely due to the fact that the infection of the fruit is due to the favorable climatic or weather conditions. In Iowa as well as Illinois there was a great deal of rain at the time of flowering and immediately following, hence the conditions were favorable for infection. In New York, on the other hand, they had a period of dry weather which of course was not favorable for the development of the fungus and the infection of the young fruit. Blisters are frequently found upon the leaves of the apple and upon the fruit itself, in some cases the fruit was somewhat gnarly, due to the effects of the frost. Mr. Stewart and his assistants of Geneva, New York Agricultural Experiment Station investigated an instance of this kind. That frost will cause mechanical injury to leaves which resembles the action of certain fungi there can be no doubt.

Time will not permit a fuller discussion of this subject. I desire to briefly discuss a few of the diseases of vegetables.

During the past seasons there have been some complaint from different parts of the state about corn wilt, a disease that has been studied by Prof. Stewart of the New York Agricultural Experiment Station and found to be due to a specific bacterium, (*Pseudomonas Stewartii*.) The organism is found very abundantly in the fibro-vascular bundles of corn. Stewart briefly called attention to a disease occurring on Long Island which had the following characters: The plants wilt and dry up, although the leaves do not roll as they do when they dry up from lack of moisture. In young plants death occurs in a few days. In older plants it requires a longer time for the disease to run its course. The disease may attack the plant at any stage of growth, but is most injurious when the ears are forming. The disease is scattered through the field, diseased plants frequently occuring in the same

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hill with healthy ones. It is also found on various kinds of soil, but it seems to prefere the early dwarf varieties of corn, like the Manhattan. Stewart further states that certain varieties are more severely affected than others. It was first observed at Queens, N. Y., where it has been known for three years. Occasionally an entire crop has been ruined and a loss of from 20 to 40 per cent has been frequent. This disease seems only to effect the sweet corn. Field corn and pop corn are entirely exempt.

The remedy for this disease of course is a thorough rotation of crops. I can not leave the subject without giving a discussion of the wound parasites and the diseases produced by higher fungi. No doubt in many cases there are produced by the sickly condition of the tree itself, in other cases they are directly responsible for the disease. A few years ago the severe freeze left the trees in a low state of vitality giving these semi-parasitic fungi a chance to complete the distruction of the tree. We have here several of tree fungi showing the distruction of trees by such semi-parasitic plant.

During the past season there has been much trouble with a disease known as the potato blight, (*Phytopthora infestans*.) This disease is commonly referred to in the East as the late blight, a disease that has done very much havoc to the potatoes in the eastern states. During the month of July it was found that the blight made its appearance in many patches in the vicinity of Ames. The leaves were spotted, the spots of various sizes, showing a white, frosty substance on the under surface of the leaf. On the border of the spot it was paler in color while in the center it was darker. In badly diseased speciments the leaves wilted and rotted as well as the stem. Now this disease is easily prevented by treating with Bordeaux mixture.

Messrs F. C. Stewart, H. J. Eustace and F. A. Sirrine have shown the following facts; "The farmers' business experiments were designed to determine the actual profit in spraying potatoes under ordinary farm conditions. The increase in yield was determined and an account kept of all expenses. Late blight being destructive, the spraying proved highly profitable. On the total area of 61½ acres sprayed in the six experiments in different parts of the state there was a total increase in the yield of 3,746 bushels, or an average of 61.24 bushels per acre. At 5o cents per bushel the increase was worth $1,873. Subtracting from this amount the total expense of the spraying, $296.49, there is a remainder of $1,576.51 which is the total net profit. This is at the rate of $25.77 per acre."

One of the other serious diseases during the past season was a rot of carrots. This seems to affect the carrots on our grounds. It is caused by a bacterium that works in the fibro-vascular bundles. Then there was considerable trouble with a disease upon celery and parsnips.

SOME HORTICULTURAL INVESTIGATORS AND THEIR CREATIONS.

BY PROF. E. E. LITTLE, AMES.

In all lines of endeavor there has been progress and advancement. And this is true in pomology or fruit growing. The achievements in this state along this line fully demonstrate the interest that has been manifested in the

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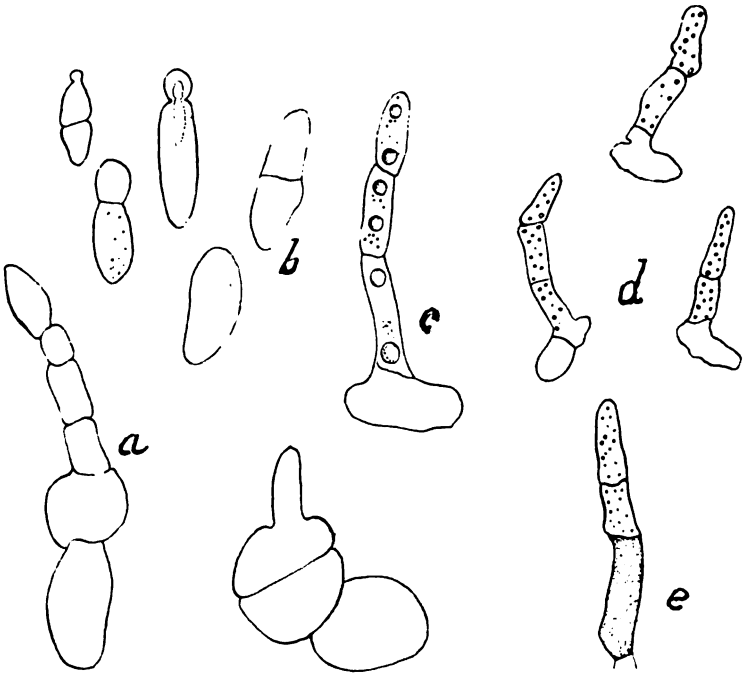

Plum scab (*cladosporium carpophilum*) on American plum, *a* basal cell and short threads with spore on the end, *b* two celled spore, *c* basal cell, short conidiophore and spore at the end, *d* spore germinating, *e* a single conidiopore.

By L. H. Pammel.

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short period of activity. In other states the work has received a marked stimulus, owing to the fact that prizes have been offered to encourage individual initiative in developing new varieties.

In writing this paper it will be impossible to trace the work of many who are carefully and thoroughly working to develop a better pomology. In a brief manner I will attempt to review the work of a few men who have done and are doing much along this line. The paper is written with a hope that through some suggestion of the achievements made by these men, others may catch some points and be encouraged in their endeavors to promote and improve the pomology of this section.

It has only been within the last half century that the native plums have been greatly improved: Among the first men to recognize the pomological importance of these native sorts when brought under native cultivation was Mr. H. A. Terry of Crescent, Iowa. Through the efforts of this one man many varieties have been produced. Many of them are now widely grown. His work has been carried on for a great many years under the most trying conditions. Among the large list of varieties that he has introduced I can only mention two or three that seem to be the most promising.

Among his early productions is a variety which is now grown in many sections of the state. It is the Hawkeye and originated from the seed of the Quaker, and introduced by him in 1883. Form, roundish conical; size, large, 1½ x 1⅜ inches; color, yellow surface, overlaid with red; flesh, firm, melting; flavor, sweetish, pleasant; quality, good. A good variety and one of the most widely planted of the Americana.

One of the earliest varieties, and regarded by many as one of the most profitable, is the Milton. Mr. Terry originated this in 1885 from seed of Wild Goose, and it has been widely disseminated. It is now widely grown in the south half of the state, aad should not be planted north of the central part. It ripens from the 20th to the 25th of July, and on account of its earliness good prices are paid for it.

Another variety that should not be planted north of Des Moines is the Downing. This originated by Mr. H. A. Terry in 1885 from the seed of the Wild Goose. Same as the Milton. The tree is a low grower and spreading. Fruit ripens August 20 to 25. Form, round; skin, thin; size, medium to large; color, bright red; flesh, juicy but firm; quality, good.

A variety of this production that shows a great deal of promise and one of the largest fruits yet introduced is the Terry, it having both the Americana or native and Hortulana or Hybrid as its parentage. It is described by Professor Craig under the name of Free Silver, but this name has been substituted for Terry. The form is regular, oval; size, large, 1¾ x 1½ inches; cavity, small, shallow; stem, ⅜ to ½ inch; suture indistinct; apex rounded; surface smooth but not shiny; color, a clear dark red, dots small, gray; bloom, thin lilac; skin, thin, tough; acid but not astringent; flesh, firm but melting; large ovate flattened, acid next to stone, flavor a mingling of Americana and Augustifolia; quality, good; season, end of August.

Numerous other natives have been improved by this man, but space will not allow mention of the worthy varieties.

It is with a feeling of sadness that I attempt to outline briefly the work accomplished by the late N. K. Fluke of Davenport, Iowa. Mr. Fluke was one of the pioneers in horticulture, and he was foremost among those of the

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state who took up the breeding of plants. His love for plants was very keen. In early years he was a practical fruit grower, and remained at the work until he was compelled to give up the laborious work on account of failing health. But this great change in his life did not prevent him from still carrying on the work he loved, that of plant breeding. The results of his efforts fully demonstrates that most of his achievements were due to the fact that he spent years of incessant toil and study along this one line. And it is of much interest to note that at the time of his death he was bustly engaged in the work that had claimed the larger part of his attention. While making cuttings of his grape which will be mentioned later, he suddenly dropped dead.

The development of the native crab by hybridizing was a work that he devoted much attention to. He thought it was possible to hybridize the native crab and thus produce varieties that could be valuable to the Iowa fruit growers Among the several that are the most promising are Flukes No. 75, 78 and 110. The largest are about the size of a medium Rawles Janet.

He was also much interested in vine fruits, and by careful crossing produced a grape of much promise. Its parentage is the Woodruff Red x Moore's Diamond, and it has just recently come into bearing. Those who have seen it say it may be a valuable acquisition. It is still under number and has not been introduced.

Pomaceous and vine fruits did not claim all of his attention, but along the line of bush fruits and nuts he had already done much good work. He produced dewberries by crossing the raspberry on the dewberry, and several of the hybrids show promise and are under number Flukes 1, 3, 5.

He produced a pecan which seems to be valuable and an improvement.

So in all lines of pomology the work of Mr. Fluke will be felt. He has prepared the way for those now engaged in the developing of new and better varieties, and also those who come after can be guided by the results produced by him. His work has been invaluable to Iowa horticulturists.

In the early days of Iowa horticulture there came from a sister state, Wisconsin, a gentleman who had already begun work along the line of producing new varieties, and this was Mr. C. G. Patten of Charles City. His early experiences in this rigorous climate with untried and untested varieties fully demonstrated to him that to have fruit of sufficient hardiness, much work must be done in crossing and selecting the most promising varieties.

Being a great lover of plants, Mr. Patten made a careful and thorough study of the laws underlying plant breeding, and set to work in an earnest and scientific manner to produce new fruits. His results show the painstaking and thorough work he has done.

A variety which bears his name, the Patten's Greening, is now largely grown throughout the Northwest. It originated from the seed of the Duchess near Portage, Wisconsin, and brought to Iowa by him. Tree is very hardy, vigorous and productive, with strong spreading branches. Fruit large, roundish oblate. Slightly irregular, a yellowish green surface with a blush; flesh white, juicy, slightly subacid, Season October to January. See Fig.

The Minnesota State Horticultural Society has placed it on the list as a good winter variety and recommends it for hardiness.

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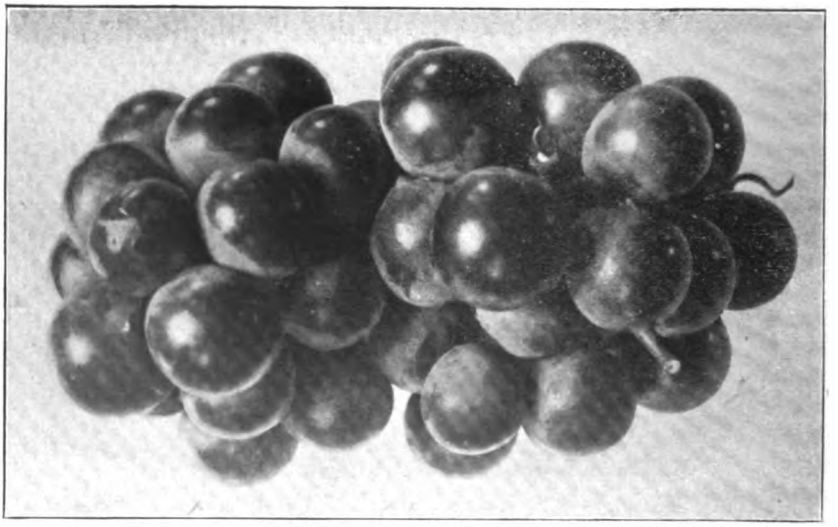

A promising seedling raised by N. K. Fluke, not yet introduced to the trade, still under number. A cross between Woodruff Red and Moore's Diamond. See page 446.

Photograph from E. E. Little.

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A seedling under the name of B. D. Sweet has been thoroughly tested and is now being introduced by Mr. Patten. The fruit is medium to large in size; form roundish, slightly oblate; pale yellow surface, striped and splashed with red. Flesh is white, tender, juicy, firm but melting; quality, good; an excellent keeper.

Other varieties that seem of much promise are just being put on the market by Mr. Patten and many of them have been under test for years. His work has not been confined to the pomaceous fruits alone, but he has shown much interest in producing hardy varieties of plum. One of the varieties that has been widely disseminated and originated by him is the Rockford. It belongs to the Prumus americana, and is very hardy and productive. It tends to overbear and should be carefully thinned.

He has just recently visited California, and while there gathered pollen of a pear and sent a quantity to his home to use in crossing, with the hope of getting a hardy and productive variety for the cold sections.

His faithful and earnest endeavors along all lines of pomological investigation are now recognized by all the eminent horticulturists of the country.

OUTDOOR ART AND MORALS.

BY D. W. WYLIE, IOWA CITY.

The interpretation of nature is one of the achievements of our modern world. Perhaps we may say that it is the achievement, because all our wisdom which we claim as peculiarly our own has come to us as a result, in a great measure, of the knowledge which we have gained regarding the heavens and the earth.

Since one stood and said, "Behold the lillies, how they grow", we have been taking notice of these things; trying not only to see how they grow, but why; and so to determine the effect which their beauty has produced upon our lives.

There has always, from the dawn of history, been a strange, universal companionship between man and nature. We have learned to know ourselves by knowing nature, and we have learned to know nature by knowing ourselves.

The out-door world is appreciated, studied, and cared for, today, more than ever before since history began. For ages the mountains have been robbed of their treasures, the plains despoiled, the forests devastated. Nature was appreciated for the material rewards or for the mere sensual emotions which she gave. Today, while it is true that the materialistic spirit is still prevalent, yet, there is a growing inclination to find in nature the inspiration and the satisfaction of some of the profoundest needs of the soul.

In ancint times we find those old peoples rather indisposed to consider the charms of out door beauty.

"The classic spirit was averse to enthusiasm for mere nature? Humanity was too prominent, and city life absorbed all interests, besides the solitude necessary was peculiarly disagreeable".

Sketches and Studies—Symonds-1-3.

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It is true that Horace and Virgil have given us some beautiful pictures of rural life; yet it can hardly be said that they are the result of any real enthusiasm on the part of the poets for nature alone. Nature was simply the background for the portrayal of their own moods and fancies.

During the dark ages the same conditions existed. Those who were educated were under the influence of the classic spirit; while those who were not, were engaged in strife with their neighbors or found the conditions necessary for existence so exacting upon time and strength, or gave themselves to the religious life so zealously, that they found no time for either the appreciation of or thought concerning their natural surroundings.

The great result of the Renaissance was the creation of the modern world. The old conceptions gave place to the newer and truer ideas. Freedom from material, religious, and political tyranny was gained, man came to himself and at the same time became conscious of the power, beauty and sublimity of nature. America was discovered, modern science was born and man began to see the heavens and the earth as he had never seen them before. The records of the old explorers tell us the wonderful power which the wild and sublime scenry of the new world produced upon them. It was a new world, and therefor an interesting one.

It has been said that, "The French Revolution, the criticism of the Bible, Pantheistic forms of religions feeling, land-scape paintings, Alpine traveling, and the poetry of nature, are all signs of the same movement, of a new Renaissance".

As we turn then to the consideration of nature in the light of its ministry to morals. We are but proclaiming ourselves in a new and real way as children, not only of the past, but also of the present age in which we live and we show the aspiration which we have of a spirit of prophecy in regard to the future.

Literature, science and art have wrought a sympathy within us for the inanimate world. "We have learned to look on the universe as a whole, and ourselves as a part of it, related by close ties of friendship to all its other members".

The great poets of the last century were all apostles of this spirit, indeed this was their message to the world, Wadsworth, Shelley, Tennyson, all sing of the spirit in nature which speaks to the spirit in man. It may be said, that in a measure, the profoundly religious spirit of our great poets may be attributed to some extent to their love for nature and to the truth and beauty which they found there.

To Rousseau has commonly been given the credit for first having "invented the love of nature." But he was only one of the many who in France, Germany and in England, were struggling to express the "new idea of growing humanity."

Men everywhere, having thrown off the bondage of the old ideas, were hastening to enter and possess this new, yet promised land. In Germany as well as in England an appreciation of the beauties of nature and of the forms of the external world, seems to have been a part of their racial heritage of which they but now becoming conscious. We may say of them, more truly even, than of France, that their poets, artists, and scientists have given to the world that form of thought which has resulted in the spirit which we call the love of nature. In Philosophy this has resulted in

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that which we call rationalism, in religion that which we call pantheism, and in art that which we call realism.

Now the moral effect which nature has produced may be considered only in a broad way. It is scarcely possible for any one to say that such and such effects or traits of character are undoubtedly and wholly due to their material surroundings. On the other hand we may assert with equal certainty that Nature has produced certain visible and enduring effects upon the character of nations and of individuals. It has had a permanent effect upon history, art, literature and the ethical and aesthetic part of the mind.

It is usually easier to trace these effects in a large national or racial way. But if the effect has been so evident upon nations the ultimate effect must also be able to be traced in the character of the individual.

The relations of man with nature have been known and recognized by all religious systems; especially is this true of the ancient Hebrews. In their account of the beginnings of things we are told that the Lord God made a garden and placed man therein, giving him the dominion over all material things. Also that when man was driven out of this garden the curse of his sin fell also upon the earth. Here we find for the first time that the material world is effected by the moral life of man.

From other sources the same truth is being made evident, the "mysterious sympathy between man and nature." Man not only governs nature he infects and informs her.

We are beginning to understand that our well being as a nation, our position in the world of art and literature, nay, our very patriotism and our character depend more and more, as education becomes more universal, upon our natural surroundings and upon the artistic and moral use of them. Fresh air, and the salutary effect of park and boulevard are more and more noticable not only upon the health of the people in the congested city districts, but also upon their morals. The creation of a breathing place, where trees, flowers and grass may be seen, is worth more to any locality than a police station, a hospital, or a college settlement.

It is to the praise of our modern insight that the solution of the great questions of modern city life and conditions, is to be found, not in the attempt to obviate the effects of crime, poverty, and uncleanness but rather to remove their causes by creating conditions in which it will, from the very nature of things, be impossible for them to exist to any large degree. The reformation wrought in the five points district of New York is an example of the point in question.

With public interest more and more aroused to these great needs, and to the possibilities which lie in this direction, with the establishment of government and state bureaus to consider these needs and the best way in which they are to be met, it is hoped that the time is not far distant when not only the natural resources of our country, its forests and streams, shall receive the care which is their due, but that also there will be the appointment of public committees to pass judgment upon the beauty and quality and structure of private houses, as well as upon the public buildings, parks and bridges.

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This seem to be the only way in which a pure public taste and sentiment may be created. Beauty shall then arise from beauty, and beauty and purity of soul shall arise from that of nature.

Because of our climatic conditions we may look for the greatest influence to be exerted upon the morals and character of our population by out-door beauty. The moral effect of nature has always been most evident where man has been compelled to make use of nature, where he has had to make nature serve him. The great truth of existence, is the oneness of man and nature. With nature he has always been in the nearest and most constant sympathy.

Having won their country from the bondage of the sea, the sturdy Dutch threw off the yoke of the tyrant, and the Netherlands became the cradle of modern liberty. Palestine, "The threshing floor of the world," has given to humanity the winnowed grain of truth in religion. The silent majesty of mountain and valley has been the bulwark of Swiss patriotism for centuries. While England owes her most inspired poetry and her most powerful eloquence, to the love which her honored sons have had for the natural features of their native land. When man has made nature serve him there has always been found those virtues which are the only stable foundation of national and domestic life. Where the reverse has been true, the effect of natural beauty has been immoral. The valleys of the Euphrates and the Nile were known throughout the ancient world for their beauty. Yet here was to be found the greatest corruption, now the name of the one is used for desolation and that of the other for death. Of Rome, the same may be said, while of Greece we are told:

"Nowhere in any age of Greek history, or in any part of Hellas, did the love of physical beauty, the sensibility to radiant scenes of nature, the consuming fervor of personal feeling, assume such grand proportions and receive so illustrious expression as they did in Lesbos. At first this passion blossomed into the most exquisite lyrical poetry that the world has known; this was the flower time of the Aeolians, their brief and brilliant Spring. But the fruit it bore was bitter and rotten. Lesbos became a byword for corruption. The passions, which for a moment had flamed into the gorgeousness of art, burning their envelope of words and images, remained a mere furnace of sensuality, from which no expression of the divine in human life could be expected."

The absence of these merely emotional characteristics in the tendencies of modern life would seem to point to a moral influence of greater power than any that the world has yet experienced. It was the birth of the spirit of appreciation of nature which in some way, has marked all the great epochs. The very state of man's awakening to the beauty and grandeur of the world about him tells of a moral and a spiritual need which he feels will be satisfied only by a deeper knowledge of, and sympathy with, his environment. If there is anything which will bring us near to a knowledge of that Power which rules over life and destiny, if there is anything which will point out the course of the future, it certainly must be that wisdom and understanding which we possess of the "framework in which the national character is enclosed, by which it is modified, beyond which it can not develop itself."

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The question is, can we gain such knowledge in regard to our own present and future? Shall the genius of art and science prove equal to the task of overcoming the barriers of natural conditions which stand in the way of future development?

It was not a coincidence that Sinai and Palestine stand at the two great turning points in the history of the ancient Hebrews. It is not a coincidence that the poetry and philosophy and worship of ancient Greece were colored to such a great degree by the physical features of that country. Neither is it a mere chance that the greatest events of history are connected with those portions of the earth which have been deeply changed by volcanic action.

"Palestine, Greece, Italy, Switzerland and Scotland, the countries that have had the most remarkable history, and have done the most to advance the human race, are distinguished above other countries for their geological convulsions and revolutions."

The fortunes of the battlefield, the march of armies, the choice of capitols, the life, the character, literature, philosophy, worship, art and music; a glance will show how eminently all these have been influenced by the natural features in which the life of these nations has been cast. The Bible itself stands as a proof of the influence of the beauty of "God's Out-Doors" upon the moral and ethical life of a people. "Here man and nature stand as close to one another as in the child's fairy story or the poet's dream. Nature's eternal lesson is the everlasting reality of religion."

The relation of out-door art to good morals is always by way of interpretation and not simply by way of scientific knowledge. As Goethe says: "Nature will reveal her secrets to mind alone, they can not be forced from her." Therefore, when we go forth to beautify the world, if out-door art is an art, then it must be by way both of an interpretation and an expression.

The elevating effect of art of any kind depends not only upon the fact of its being an interpretation of an idea, but also upon its being an expression of the moral and æsthetic nature. It is a giving of the human spirit to the world. And so our out-door art is the giving of the human spirit in terms or through the medium of material objects, as trees, hillsides, rivers, and plains. The effect, then, of out-door art upon morals must be obtained in the same way as that gained by any other art. "It is the business of art to create an ideal world, in which perception, emotion, understanding, action, all elements of human life sublimed by thought, shall reappear in concrete forms as beauty. Art is not the school or cathedral of humanity, but its playground, its paradise. Here truth and goodness are transmuted into beauty."

It exercises those parts of the senses which are more inclined to carry impressions to the spiritual centres of the soul. The emotions which are constantly seeking to express themselves are given the proper stimulus. The greatest effect however lies in this, that it forms a contrast to the hard world of work in which we are plunged so constantly; and gives the mind the impulse to arise into the higher atmosphere of ideals, where the soul may contemplate, not what is necessary but that for which it has an affinity

Like the passion for liberty which is the binding power alone able to unify the many various elements of our citizenship today, this, the largest of all arts will bind men together, not by oneness of need or of profession, but by a common likeness of faith, ideals, and hope.

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It is not for us to build a new empire, nor to discover new lands, for us there remains the higher and grander destiny of the reoccupation of our fatherland in the making it to serve the mind as well as the body. Permitting it to create thoughts and ideals as well as dollars.

Our fathers filled their coffers from the treasure house of plain and mountain; it is for us to make these minister to our spiritual and moral welfare, the priests of an heavenly truth which shall declare to all the relation between man and his maker.

With fine in sight Bacon has said:

"To plant a garden is the purest of all human pleasures. It is the greatest refreshment of the spirits of man; without which, buildings and palaces are but gross handiworks, and a man shall ever see, that when ages grow to civility and elegancy, men come to build stately, sooner than to garden finely, as if gardening were the greater perfection." And it would seem that some communion with nature was positively necessary to the greatest thinking and acting. "All natural leaders come from the country, says Emerson, woods and field make the education of all great men. A nation must be grounded in the ethics before it can conquer the world."

Nature finds her crown of glory in man and man finds his inspiration in nature, Not a stroke of the hand in tilling or beautifying the earth, in felling the forests, in changing the natural conditions, but leaves an indelible impress upon the soul.

"One impulse from the vernal wood
Can teach you more of man
Of moral evil and of good
Than all the sages can."

That which inspires loyalty to truth, purity, beauty, is the force which makes the world better; and it is this which makes nature and the natural world the dominant force in life and the power making most for the culture of clear thought and pure minds.

Not a sun set may crimson the western sky but you may hear the heavenly host singing, "Holy! Holy! Holy! Lord God Almighty." You may in the unfolding of the meanest flower "see God in his glory passing before you." Each mountain will speak of courage and steadfastness, each plain of peace. This shall not only be our country but our home and not only our home but our sanctuary.

"The race must become partner with, and fellow worker with the Universe at its ethical task, if its heart of rythm and soul of fire are to stand fully revealed."

And this, I take it, is a part of the meaning which may be given to the moral influence of out-door art. So we are

"Well pleased to recognize
In nature
The anchor of my purest thoughts, the muse,
The guide, the guardian of my heart, and soul
Of all my moral being."

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THE NATIVE SHRUBS OF IOWA.

BY B. SHIMEK, IOWA CITY.

In our search for ornamental and protective plants we are inclined to reach out beyond the limits of our native flora. There is a magnetic charm in things exotic which sometimes leads us to discard the familiar native plant simply because it is commonplace, and to adopt a much less satisfactory, or at least no more useful, introduced plant merely because of its novelty. Our native shrubs suffer in common with other native plants in this respect.

Within the limits of our state are found more than ninety species of native shrubs, belonging to every conceivable habitat which may be found within its limits. There are species belonging to the rocky bluffs, to the comparatively barren, rocky, or gravelly ridges, to the wooded slopes, to the alluvial bottoms, to sandy tracts, to the open prairie, to the swamp, and even to the perennial pond and stream. Not all of these species are equally beautiful, not all are equally easily obtained, not all are equally hardy or equally easily cultivated, but we may find shrubs within the limits of our state which are suitable for every possible condition or position in which shrubs are desirable, and they have the great advantage over most imported plants that they are already acclimated through generations of adjustment and adaptation to our natural conditions.

While it is true that some of these native shrubs are not easily cultivated, in the majority of cases the failure is due to the carelessness of the operator, or to an attempt to transplant the shrub from its native habitat to one which is quite different.

Some of these native shrubs are insignificant or unattractive; some are suitable only for very peculiar habitats; some are most ornamental or most useful in leaf, some in flower, and some in fruit; but, largely because of these differences, we may select among them species which are adapted to different seasons of the year, and to pratically all possible conditions which could be encountered within the limits of our state.

In selecting native shrubs for planting we must ascertain in detail the requirements of our case. We must note the purpose for which the plants are to be used, the ultimate size desired, the character of the habitat, the season of the year in which the best effect is desired, and in accordance with the results of our investigation we must then select those shrubs which are by nature best adapted to the conditions noted.

As an aid to such selection it may be of interest to consider our Iowa shrubs with a view to their possible uses. Where grounds are large and present a great variety of conditions a very extensive use of shrubbery is possible, but large grounds of this character are as yet the exception in our state. But even on small grounds, on the city lot, the country garden patch, much satisfaction may be gained from a judicious disposition of shrubbery, and many of our native shrubs are not only useful for such purposes, but are commonly near at hand and can be easily secured.

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The following are some of the most common purposes for which shrubbery is used, and in each case the native species most suitable for the stated purpose are listed:

1. *For hiding fences, etc., and for backgrounds.*—This is often desirable even on very small grounds. Perhaps it is an unsightly partition fence; perhaps a barnyard or poultry-yard fence, or corner, which may be effectively concealed by a careful selection and disposal of shrubs. For such purposes the more remote background, especially where the trees are not too small, may be formed of such species as sometimes assume the form of small trees. These, if crowded together, will usually form dense thickets, and will remain shrub-like for a long time. Such are the wild plum, the two larger species of black haws, the larger dogwoods, the juneberry, chokecherry, prickly ash, burning bush (wahoo), and bladdernut. On larger grounds small trees, such as the crab, and the hawthorns, may be added with good effect. The following species may be set against this background, or may be similarly used where smaller plants are desired: the wild black currant, wild gooseberry, Indian currant, wolf berry, blackberry, raspberry, etc. All these make a dense covering near the ground, and would conceal the bases of taller plants, and low objects.

2. *For hiding stumps, trellis-work, porches, etc.*—For such purposes the woody, high-climbing vines are suitable. One of the very best where dense foliage is desired, as for porches, etc., is the Virginia creeper. Its very vigorous growth makes it objectionable, however, where a limited amount only of such cover is desired. The bright red color of its foliage in early autumn makes this species very ornamental at that season of the year. The climbing bittersweet is another valuable woody vine. It may be readily cultivated, and is especially showy late in autumn because of its abundant bright-colored fruit. The several species of wild grapes, the moonseed, and the greenbrier may also be used where green foliage alone is desired. Of flowering woody vines the trumpet creeper, which flowers profusely in early summer, is very useful, especially in the southern half of the state. It does not withstand the winters northward unless well protected.

3. *For ornament.*—Many of our shrubs serve purely ornamental purposes, and their use for such purposes should be more extended. Some are admired for their flowers, others for their foliage, and still others become ornamental in fruit. They may be planted singly, or in groups according to habit as discussed under habitat. So varied are these plants in their attractive characters and in their habits, that we may select a series of them which will please the eye from early spring until late autumn. Among the earliest flowering forms the juneberry and wild plum produce their profusion of white flowers while the remainder of the plant world still slumbers. They are soon followed by the chokecherry and the purple virgin's bower, and later by the nine-bark, the two larger black haws, the dogwoods, wild roses, wild indigo, and the yellow honeysuckles. The nine-bark, the black haws and the dogwoods deserve special attention because their abundant white flowers usually appear just in time for Decoration Day purposes at a time of the year when there is a period of comparative scarcity of flowers between the spring and summer seasons. Later, usually before midsummer, the meadowsweet, lead plant, Jersey tea, and trumpet creeper furnish showy flowers. Finally the last of the more ornamental

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American Yew, Northeastern Iowa. See No. 1.

Common Juniper, Northeastern Iowa. See No. 2.
Photograph from B. Shimek.

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shrubs to flower, the witch hazel, develops its fragrant flowers after the first frosts in attumn.

Other forms are desirable for their foliage. Some, such as the shiny willow, and in a lesser degree the honeysuckles, the smaller juneberries, etc., present a more or less pleasing aspect throughout the summer, while others, such as the sumacs, the Virginia creeper, and the mountain maple, do not reach their greatest beauty until early fall, when their flaming foliage makes them conspicuously attractive.

Still others are made ornamental by their fruits, and are as a rule suitable for autumn decorative purposes. The bittersweet, wahoo, the staghorn and smooth sumacs, the wolfberry, the Indian berry, and some of the dogwoods, are examples.

Finally, a few are ornamental even when devoid of foliage, the red osier, a shrub which is made most conspicuous by its bright red twigs in midwinter, being the most striking example.

Of course not all of the foregoing forms grow in the same situations, and not all of them can be cultivated in the same place. If we are to judiciously select species suitable for a particular tract, we must give heed that the plants which we choose are by nature adapted to the conditions under which we wish to cultivate them, for comparatively few of our native shrubs can be successfully grown under conditions other than those which surround them in their native haunts.

4. *To prevent washing of soils, etc.*—Occasionally it is desirable to combine usefulness with beauty. Streams or seepy places may cause washing and slipping. In such places this may be prevented, and its unsightly effects concealed, by clumps of the smaller willows, of which the shiny willow is by far the handsomest, and by other low-ground species. Where such soil is sandy the sandbar willow will effectively prevent erosion. In low, wet places the buttonbush is serviceable and pretty. Frequently farmhouses are built near small streams which cause more or less trouble on account of washing. Not only may this be prevented, but the barnyard, hog-lot, etc., which are often made to include a part of the stream, may be concealed, and the surroundings beautified, by the use of shrubs which are adapted to wet habitats.

The question of habitat is one of great importance. As already stated our shrubs vary so much in habit that some are adapted to every condition existing in the state. The more useful shrubs are here enumerated with reference to their habits.

Low, wet places furnish us the beautiful shining willow, the button-bush, the meadow-sweet; the red-osier dogwood, etc. From the borders of streams, etc., come the false indigo, the wild grapes and some dogwoods; from sandy places the sweet-scented sumac and the sandbar willow; from rocky places and shaded banks the chokecherry, Juneberry, witchhazel, staghorn sumac, bladdernut, mountain maple, leatherwoods, some blackhawks, and the purple virgin's bower; from more open places, borders of groves, etc.; we have the nine-bark, smooth sumac, some roses, wild plum, prickly ash, and New Jersey tea; from the prairie the lead plant, the fragrant false indigo, and some roses; and from woods and thickets the wahoo, Virginia creeper, bitter-sweet, some dogwoods, moonseed, smooth

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rose, honeysuckles, greenbriers, wild, black currant and buckthorn. An examination of the notes which follow the key will reveal other forms.

If native plants are selected for cultivation, it is best to select small but thrifty individuals, as these take root more readily, and produce better results. It is also desirable that they be transplanted when leafless, in the fall or early spring.

THE KEY.

To aid in the identification of our native shrubs the following key is offered. It is arranged with reference to characters which are easily made out, and which do not require technical knowledge of botany. It must be borne in mind, however, that some of our smaller trees, such as hawthorns, etc., are shrub-like when young, and these are not included.

To use the key begin at the very beginning and follow every step carefully, omitting nothing except where there are subdivisions of a greater group to which your plant does not belong. For example, if your plant does not belong to division I in the key, omit all that follows up to division II, etc. The smaller subdivisions are denoted by the distance from the margin of the page to the beginning of the line. Divisions of equal rank are at the same distance from the margin of the page. The numbers to the right refer to the list following this key. When a line which ends in a number is reached turn to that number in the list. A few terms which may not be clear to those who are not botanists are defined at the close of this paper.

THE KEY.

I. PLANTS EVERGREEN, WITH NEEDLE-LIKE LEAVES.

Leaves two-ranked, hence leafy branches flat; berry red 1
Leaves not two-ranked, branches not flat; berry dark blue..... 2

II. PLANTS NOT EVERGREENS.

1. *Vines, variously climbing.*
   a. Stems more or less spiny.
      * Leaves simple, green on both sides; plants climbing by tendrils at bases of leaves 3
        Leaves rather thin, often contracted at the middle..... 4
        Leaves thicker, not contracted at the middle..... 5
      ** Leaves compound; plant without tendrils, flowers showy..... 38
   b. Stems not spiny.
      * Leaves simple.
        Plants with alternate leaves.
        Leaves broad, at least some heart-shaped at base, more or less lobed.
        Stems twining, without tendrils.
        Edge of leaf toothed..... 9
        Edge of leaf without fine teeth 5
        Stems not twining; plants climb by tendrils.
        Lobes of leaves 3 to 7, prominent.
        Leaves woolly, at least when young; fruit ripens in summer..... 6

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Leaves smooth, or hairy only on veins beneath; fruit ripe in fall 7
Lobes of leaves 3, not prominent, or none.
Leaves white-hairy, especially beneath..... 8
Leaves smooth, or slightly hairy on veins beneath 9
Leaves narrower, not heart-shaped at base, nor lobed..... 11
Plants with leaves opposite; bloom on lower surface.
Leaves usually hairy beneath, stamens not hairy at base; berries yellow 13
Leaves not hairy beneath, stamens not hairy at base; berries red 14

** Leaves compound.
Leaflets three.
Leaves opposite, flowers showy..... 16
Leaves alternate, flowers small 17
Leaflets more than three.
Leaves palmate, leaflets usually 5, flowers small..... 10
Leaves pinnate, leaflets 7 to 11, flowers large..... 22

2. *Shrubs.*

a. Stems spiny.

* Leaves simple.
Leaves opposite..... 23
Leaves alternate or clustered.
Plants commonly tree-like, sometimes shrubby, branches quite thorny 86
Plants smaller, commonly tufted shrubs.
Fruit spiny..... 24
Fruit smooth.
Stamens protruding from flower; spines 2 or 3 together.
Bark purplish, spines slender..... 25
Bark gray, spines short..... 95
Stamens not protruding from flower; spines solitary 26

** Leaves compound.
Flowers more or less showy, fruit fleshy.
Blackberries and raspberries.
Fruit red..... 29
Fruit black.
Stem with hooked or curved prickles.
Leaves smooth, prickles weak 30
Leaves hairy, prickles strong..... 31
Stem with straight prickles or smooth.
All the leaves with three leaflets..... 32
Upper leaves with one leaflet; fruit small..... 33
Roses.
Fruit hairy 35
Fruit smooth.

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Prickles few or none; plant taller, in woods..... 34
Prickles abundant, at least below; low shrubs of prairie.
Densely prickly 36
Prickles usually absent above; fruit with bloom..... 37
Flowers inconspicuous; fruit not fleshy 39

b. Stems not spiny.
* Leaves opposite, or rarely three in a whorl.
† Leaves simple.
Leaves with entire edges.
Flowers yellow, leaves narrow; branchlets two-edged; fruit dry..... 40
Flowers white, greenish or pink, leaves broader.
Fruit dry; flowers in a spherical stalked cluster; some of the leaves in whorls of three..... 97
Fruit more or less fleshy; flowers not in a spherical cluster.
Flowers in clusters, or pairs, in axils of leaves.
Fruit white 47
Fruit red.
Flowers in pairs, greenish white, edges of leaves hairy 15
Flowers in clusters, pink, leaf edges not hairy 48
Flowers in clusters at the ends of stems, white, small.
Leaves with loose down beneath.
Leaves very broad, fruit blue, twigs green, warty 41
Leaves narrower, twigs not green.
Twigs purplish, the youngest often downy; fruit blue. 42
Twigs reddish brown, the youngest hairy; fruit white..... 43
Leaves smooth, or with short appressed hairs beneath; fruit white.
Twigs bright purplish red..... 44
Twigs purplish..... 42
Twigs gray 45
Leaves with edges finely toothed.
Fruit dry, flowers yellow..... 53
Fruit more or less fleshy; flowers not yellow.
Fruit red; flowers dark purple..... 12
Fruit black; flowers white.
Leaves tapering into a long point; leaf-stalks usually wing-margined..... 49
Leaves not long tapering, leaf-stalk not winged 50

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Leaves with edges coarsely toothed, or wavy (slightly lobed).
Flowers white, fruit black, leaves heart shaped at base, teeth sharp 51
Flowers pink, fruit white, leaves not heart shaped at base, teeth or lobes very blunt 47
Leaves distinctly palmately lobed.
Flowers snowy white, fruit fleshy, red 52
Flowers not showy, fruit dry, winged 54
†† Leaves compound.
Leaflets 3; fruit inflated, dry 55
Leaflets 5 to 11, leaf pinnate; fruit fleshy.
Twigs smooth, pith white, berries black 56
Twigs downy, pith brown, berries red 57
** Leaves alternate.
† Leaves compound.
Leaflets 3.
Fruit dry, winged 58
Fruit somewhat fleshy, not flattened or winged.
Fruit red, hairy.
Leaflets with few very blunt teeth; odor unpleasant ... 18
Leaflets with rather numerous sharp teeth; odor pleasant 19
Fruit white, smooth; stems often climbing 17
Leaflets 5 or more, pinnately arranged.
Leaflets 5 to 7, flowers yellow, bark shreddy 59
Leaflets more than 7.
Flowers purple, fruit dry, stem without milky juice.
Plant more or less white-hairy, leaflets 21 to 49 61
Plant smooth, or nearly so, leaflets 11 to 21.
Plant low, 1 foot, or less 62
Plant taller, usually more than 3 feet high 60
Flowers greenish or yellowish, fruit red, rather fleshy, hairy stems with milky juice.
Twigs and leaves smooth 21
Twigs and lower surface of leaves hairy 20
†† Leaves simple.
Leaves entire, margin without teeth.
Fruit a fleshy berry; flowers not in catkins.
Flowers red or pink, fruit black, twigs downy 63
Flowers yellow, appearing before leaves, fruit red, twigs smooth 64
Fruit a small dry pod, seeds hairy, *willows*.
Twigs smooth 67
Twigs more or less downy.
Leaves densely white—hairy beneath, sparingly above 76
Leaves more or less downy on both surfaces, or nearly smooth.

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Plant 6 to 15 feet high; leaves often slightly toothed 66
Plant 1 to 2 feet high, edges of leaves turned or rolled in 74
Leaves more or less toothed on the edges, but not lobed.
Fruit a small, dry pod, seeds hairy, *willows*.
Leaves and twigs smooth, shining 68
Leaves and twigs more or less downy, at least when young.
Leaves with white waxy bloom beneath; flowers appearing before the leaves.
Leaves taper—pointed, sharp, slightly silky when young, branches slender 72
Leaves not taper-pointed, but blunt or sharp at tip.
Leaves irregularly toothed, or nearly entire; plant larger 70
Leaves with small teeth; plant usually less than 6 feet high 73
Leaves without waxy bloom.
Teeth on edge of leaf obscure, or far apart.
Leaves downy above, soft, hairy beneath 66
Leaves silky when young, finally smooth; teeth far apart 71
Teeth on edge of leaf fine, numerous.
Leaves gray, and more or less hairy beneath ... 75
Leaves smooth, or hairy only on midrib 69
Fruit dry but seeds not hairy.
Flowers not showy, at least one kind in catkins.
Fruit a nut inclosed in cup of two scales 90
Fruit a short spike of small nutlets 65
Flowers more or less showy, not in catkins.
Flowers yellow, sweet-scented, appearing late in autumn 89
Flowers white.
Leaves smooth 79
Leaves downy.
Leaves broadly rounded or heart-shaped at base 87
Leaves narrower, not broad at base 88
Fruit more or less fleshy.
Mature leaves smooth.
Fruit with a stone—*Cherries*.
Low shrub, leaves narrow, fruit dark red 84
Taller shrub, or small tree, leaves broader, fruit black.. 85
Fruit with several seeds (like red-haw), leaves broad, rounded.
Fruit red or purplish.
Leaves toothed above the middle only 82
Leaves toothed all around 81
Fruit black 80
Mature leaves more or less hairy, at least beneath.
Leaves hairy on both surfaces 83
Leaves hairy beneath, only.

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Fruit red..... 77
Fruit black.
Larger shrub, or small tree; fruit two-seeded..... 91
Low shrub, fruit three-seeded..... 92
Fruit blue, bark greenish; leaves very finely toothed .. 46
Leaves more or less distinctly lobed.
Leaves pinnately lobed.
Lobes not deep, often like coarse teeth; cup of acorn thin.. 94
Lobes prominent; cup thicker, usually fringed..... 93
Leaves palmately lobed.
Fruit a dry capsule.
Flower stalks and calyx smooth..... 78
Flower stalks and calyx downy..... 96
Fruit a fleshy berry.
Berry hairy, red; plant low..... 27
Berry smooth, black; plant larger..... 28

LIST OF SPECIES.

For the sake of accuracy the scientific name of each plant is given in the list. Where two occur the first is that recognized in Britton's recent Manual, and the second that used in Gray's Manual, sixth edition.

1. AMERICAN YEW. (*Taxus minor* (Mx.) Britt; *T. Canadensis* Willd.) A low spreading shrub. In rocky woods in northeastern Iowa.

2. JUNIPER. (*Juniperus communis* L.) A shrub or low tree, with prickly leaves which are commonly whitened above. In open woods on rocky hills. Northeastern Iowa.

3. LONG-STALKED GREENBRIER. (*Smilax pseudochina* L.) A climbing woody vine, with a few weak bristles below; the leaves often narrowed at the middle; berries black. In dry thickets, northward and westward in the state.

4. GREENBRIER. (*Smilax hispida* Muhl.) The green stems are more thickly covered with blackish bristles, the leaves are thinner, and are not narrowed at the middle; berries bluish black. Common in thickets, especially on lower grounds.

5. MOONSEED. (*Menispermum Canadense* L.) High-climbing vine, with dense foliage; flowers not showy, but the black fruit conspicuous. Common in thickets.

6. WILD GRAPE. (*Vitis vulpina* L.; *V. riparia* Mx) The common wild grape along streams, etc. Its fruit usually ripens in August. Common along wooded streams.

7. SMALL GRAPE. (*Vitis æstivalis* Mx.) Leaves large and usually more hairy than in No. 6, and fruit ripening later. Not common. Eastern part of the state.

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8. DOWNY GRAPE. (*Vitis cinerea* Englm.) Readily recognized by its woolly twigs and leaves, the latter often not lobed. Southeastern Iowa, in thickets on low grounds.

9. SIMPLE-LEAVED AMPELOPSIS. (*Ampelopsis cordata* Mx.; *Cissus ampelopsis* Pers.) A smooth vine, with few or no tendrils. Flowers not showy; berries bluish. On low grounds. Reported from southern Iowa.

10. VIRGINIA CREEPER. (*Parthenocissus quinquefolia* (L) Planch.; *Ampelopsis quinquefolia* Mx.) A very useful vine, readily recognized by its palmate leaves, with usually five leaflets. Some forms are high-climbing by both rootlets, and tendrils with disks at their tips, while others have only the tendrils. A low form, with deeply toothed leaves and without disks on the tendrils, is found in Iowa, and has received the name *P. quinquefolia laciniata* Planch. Very common in thickets and woods, and also along fences, edges of thickets, etc. Easily cultivated.

11. CLIMBING BITTERSWEET (*Celastrus scandens* L.). A well-known woody vine, or rarely scarcely more than a shrub, with greenish flowers and bright red fruit which is very ornamental in autumn. In thickets, rich woods, etc., everywhere in the State. Easily cultivated.

12. WAHOO (*Euonymus atropurpureus* Jacq.). A shrub or small tree, with small purple flowers appearing in June, and with bright red fruit. Common in rather low woods.

13. SULLIVANT'S HONEYSUCKLE (*Lonicera Sullivantii* A. Gray). This specimen has yellow flowers which appear in May or June, and is rather common in woods. It often reclines on shrubs, etc., without twining. It is easily cultivated in shaded places.

14. SMOOTH HONEYSUCKLE (*Lonicera dioca* L.; *L. glauca* Hill). Much like the preceding species, but usually growing on rocky banks, etc., and more easily cultivated on more open ground. Found in the eastern part of the State.

15. AMERICAN FLY HONEYSUCKLE (*Lonicera ciliata* Muhl.). A shrub three to five feet high, with the flowers in pairs appearing in May. Rare, in low woods. Reported from southern Iowa.

16. PURPLE VIRGIN'S BOWER (*Atragene Americana* Sims.; *Clematis verticillaris* D. C.) A climbing vine, or spreading over bushes, etc. Flowers handsome, purplish blue, two to four inches wide. On shaded rocky bluffs in northeastern Iowa. It may be cultivated on shaded rock ferneries or on the north side of a house.

17. POISON IVY (*Rhus radicans* L.; *R. toxicodendron*). This well-known poisonous plant is very variable. In low grounds it is usually a high-climbing vine with many rootlets on the stem; in dry grounds it is commonly a low shrub. Its three leaflets and white fruit distinguish it among our species. Flowers in May or June. Everywhere in the State.

18. SKUNK-BUSH (*Rhus trilobata* Nutt). This ill-scented shrub differs from the following chiefly in having the leaves smaller and very bluntly toothed. In dry, sandy soil. Not common; in the eastern part of the State.

19. SWEET-SCENTED SUMAC (*Rhus aromatica* Ait.). More widely distributed in the eastern part of the state. In both this and the preceding species the small flowers appear before the leaves in March.

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Poison Ivy on dead hickory. See No. 17.

Trumpet Creeper on old limekiln. See No. 22.
Photographs from B. Shimek.

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20. STAGHORN SUMAC (*Rhus hirta* (L.) Sudw.; *R. typhina* L.). Shrub or tree, sometimes reaches twenty-five feet in height. It is found in the northern and northeastern parts of the state, chiefly on rocky, shaded slopes.

21. SMOOTH SUMAC (*Rhus glabra* L.). The common well-known sumac of the state, easily recognized by its smooth twigs and leaves. It is found chiefly in dry grounds, and is then a low shrub, but in richer ground it becomes a small tree. Both this and the preceding species deserve cultivation.

22. TRUMPET CREEPER (*Tecoma radicans* (L.) DC.). Well-known and commonly cultivated for its large tubular red or orange flowers. It is very common in the southeastern part of the state in rich grounds, chiefly on lowlands, and is probably native. The flowers appear late in summer.

23. BUFFALO BERRY (*Lepargyrea argentea* (Nutt.) Greene; *Shepherdia argentea* Nutt.). A rare shrub, found only in the northwestern part of the state in dry soils. The twigs terminate in thorns, and the leaves are silvery. Plant six to fifteen feet high; fruit red.

24. WILD GOOSEBERRY (*Ribes cynosbati* L.). A spreading shrub with spiny fruit, and more or less spiny stems; flowers not very conspicuous, appearing in May. Common on rocky banks in the eastern part of the state.

25. SLENDER GOOSEBERRY (*Ribes gracile* Mx.). Similar to the preceding, but with more slender twigs and flowers, and with smooth fruit. Common, especially in dry, rather open grounds. See also No. 95.

26. NORTHERN GOOSEBERRY (*Ribes oxyacanthoides* L.). Very similar to the preceding, but usually with single spines at each joint of the stem, and shorter stamens. Mostly low grounds, northward.

27. FETID CURRANT (*Ribes prostratum* L'Her.). A low, spreading shrub, with disagreeable odor; flowers white. On rocky, shady banks, in the northeastern part of the state. Flowers in May.

28. WILD BLACK CURRANT (*Ribes floridum* L'Her.). A spineless shrub, with more conspicuous flowers, and smooth, black fruit. Grows in rather wet places, but is easily cultivated in any rich soil. Common, especially eastward.

29. WILD RED RASPBERRY (*Rubus strigosus* Mx.). This red-fruited raspberry grows in rocky places, chiefly in the southerly and eastern portions of the state. It is not so common as the following. Flowers chiefly in June.

30. BLACK RASPBERRY (*Rubus occidentalis* L.). The black-fruited raspberry, which is the original of a number of cultivated varieties, is widely distributed in the state, and grows commonly in thickets, partial clearings, etc. It flowers in May and June.

31. BLACKBERRY (*Rubus villosus* Ait.). The blackberry was originally most abundant in rather dry, open woods, but now occurs in partial clearings, along roadsides, etc. It is especially abundant in the eastern half of the state.

32. DEWBERRY (*Rubus Canadensis* L.). This almost smooth blackberry occurs sparingly in the extreme eastern part of the state, in thickets. It flowers in June and July.

33. BAILEY'S BLACKBERRY (*Rubus Baileyanus* Britt.). This low trailing form has been found in the extreme southeastern part of the state. It flowers in May or June, and the fruit is inconspicuous.

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34. SMOOTH ROSE (*Rosa blanda* Ait.). This, the smoothest of our wild roses, is common on moist banks, especially in the eastern part of the state. It flowers in June, and is especially attractive in bud, as are most of the species.

35. PASTURE ROSE (*Rosa humilis* Marsh.). This rose, which may be recognized by its hairy fruit, grows on rocky banks in the eastern part of the state. It is not common. Flowers in June.

36. PRAIRIE ROSE (*Rosa Arkansana* Porter.). This low, very prickly rose is the most common species of the prairies. It flowers in June and July.

37. WOODS' ROSE (*Rosa Woodsii* Lindl.). This species, which also grows on the prairies, is less prickly than the preceding species, and shows a more or less distinct bloom on the lower surface of the leaves and on the fruit. Flowers in June and July.

38. CLIMBING ROSE (*Rosa setigera* Mx.). Our only native climbing rose. It occurs sparingly at the edges of thickets, in the eastern part of the State.

39. PRICKLY ASH (*Xanthoxylum Americanum* Mill.). A shrub or small tree, with spicy bark; inconspicuous flowers which appear before the leaves; small numerous black pods, and with short prickles or spines at the bases of the leaves. It is common throughout the State in rather dry grounds, but will grow in all our soils.

40. SHRUBBY ST. JOHN'S WORT (*Hypericum prolificum* L.). A rather inconspicuous, yellow-flowered shrub, found rarely on rocky slopes in the extreme southeastern part of the State.

41. ROUND-LEAVED DOGWOOD (*Cornus circinata* L'Her.). On shady, rocky banks in the eastern part of the State. A shrub, two to eight feet high.

42. KINNIKINNIK (*Cornus amomum* Mill.). A medium-sized shrub, in wet places, throughout the State.

43. ROUGH-LEAVED DOGWOOD (*Cornus asperifolia* Mx.). A medium-sized shrub, in wet grounds, chiefly in the southern and eastern parts of the State.

44. RED-OSIER DOGWOOD (*Cornus stolonifera* Mx.). A shrub three to ten feet high, with very red twigs; growing in wet soils, but easily cultivated in any rich soil. It occurs locally throughout the State.

45. PANICLED DOGWOOD (*Cornus candidissima* Marsh.; *C. paniculata*) A shrub growing in open woods, etc., and perhaps the most common of our dogwoods. Locally very common.

46. ALTERNATE-LEAVED DOGWOOD (*Cornus alternifolia* L. f.). A shrub or small tree, growing in rich woods, and the only one of the dogwoods with alternate leaves. All the dogwoods flower during the last week of May and the first week of June, and all may be successfully cultivated.

47. WOLFBERRY (*Symphoricarpos occidentalis* Hk.). A low shrub, common northwestward in the State, on the prairies and in open woods, etc. Flowers in July and August.

48. INDIAN CURRANT (*Symphoricarpos symphoricarpos* (L.). MacM.) A shrub two to five feet high, growing on low grounds, rocky slopes, etc. Locally very common, especially southward in the State. Flowers in July.

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Wahoo and Hazel-nut in fruit, late in winter. See Nos. 12 and 90.

Prairie Rose. See No. 36.
Photographs from B. Shimek.

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49. SHEEP BERRY (*Viburnum lentago* L.). A tall shrub or small tree, growing in rich soil, and flowering in the latter part of May. In thickets along streams throughout the State.

50. BLACK HAW (*Viburnum prunifolium* L.). Similar to the preceding, but with narrower leaves, and growing in drier soils. More common in the eastern part of the State.

51. ARROW-WOOD (*Viburnum pubescens* (Ait.). (Pursh.) A shrub two to five feet high, growing on rocky banks. Chiefly in the eastern part of the State. Flowers in June.

52. HIGH BUSH-CRANBERRY (*Viburnum opulus* L.). A shrub five to ten feet high, recognized by its lobed leaves and bright red fruit. Flowers in June. In northeastern Iowa.

53. BUSH HONEYSUCKLE (*Diervilla diervilla* (L.) MacM.; *D. trifida*). A low shrub of rocky woodlands, found only in the northeastern part of the State. Flowers in May.

54. MOUNTAIN MAPLE (*Acer spicatum* Lam.). A shrub or small tree on rocky banks, found in the northeastern part of the State only. Flowers develop after the leaves.

55. BLADDER-NUT (*Staphylea trifolia* L.). A shrub five to ten feet high, with clusters of white flowers appearing in May. It grows in rocky woods, but may be readily cultivated. Eastern part of the State.

56. SWEET ELDER (*Sambucus Canadensis* L.). The well-known elder is common on low grounds throughout the State. It flowers in June.

57. RED-BERRIED ELDER (*Sambucus pubens* MX.; *S. racemosus*). This is less common, being confined to the northeastern part of the State. It usually grows on rocky slopes.

58. THREE-LEAVED HOP-TREE (*Ptelea trifoliata* L.). A shrub or small tree, growing in sandy or rocky woods. Flowers not showy, appearing in June. Only in eastern Iowa.

59. SHRUBBY CINQUEFOIL (*Dasiphore fruticosa* (L.) Ryd.; *Potentilla fruticosa* L.). A low shrub, usually growing on moist rocky slopes; rare in Iowa, occurring only in the extreme northeastern part.

60. FALSE INDIGO (*Amorpha fruticosa* L.). A shrub widely distributed along river courses, etc., and flowering in May or June. May be easily cultivated in rich soil.

61. LEAD-PLANT (*Amorpha canescens* Pursh). A low shrub of prairies and dry grounds in all parts of the State. Flowers in July and August.

62. FRAGRANT FALSE INDIGO (*Amorpha nana* Nutt.; *A. microphylla*). A low shrub of the prairies of northwestern Iowa.

63. BLACK HUCKLEBERRY (*Gaylussacia resinosa* (Ait.) T. & G.). A low shrub, known in Iowa only from wooded hills in Muscatine county. Flowers in May or June.

64. LEATHER-WOOD (*Dirca palustris* L.). A shrub one to five feet high, growing on shaded rocky banks. The small yellow flowers appear before the leaves, in April or May. Difficult to transplant unless small plants are taken.

65. SPECKLED ALDER (*Alnus incana* (L.) Willd.). A shrub or small tree, found along streams, etc., in the northeastern part of the State. The inconspicuous flowers appear before the leaves, in March or April.

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66. BEBB'S WILLOW (*Salix Bebbiana* Sarg.). Usually in rather dry places. Rare, and chiefly northerly. Flowers before or with the leaves. A shrub or small tree.

67. BOG WILLOW (*Salix myrtilloides* L.). A low shrub, known in this State only from bogs in Emmet county. Flowers appearing with the leaves.

68. SHINING WILLOW (*Salix lucida* Muhl.). This handsome, tall shrub is found in wet places in the northern part of the State. Flowers appear with the leaves.

69. HEART-LEAVED WILLOW (*Salix cordata* Muhl.). Shrub or small tree, along streams everywhere in Iowa. Flowers appear before the leaves.

70. PUSSY WILLOW. (*Salix discolor* Muhl). Shrub or small tree, common everywhere in Iowa, usually in low grounds. Flowers appear much before the leaves.

71. SANDBAR WILLOW (*Salix fluviatilis* Nutt.; *S. longifolia*). A shrub or small tree; common throughout the State, along streams. Flowers appear with the leaves.

72. SLENDER WILLOW (*Salix petiolaris*, J. E. Smith). A shrub growing in swamps. Rare in Iowa. Flowers develop before the leaves.

73. PRAIRIE WILLOW (*Salix humilis*) Marsh.) A shrub three to seven feet high, in dry soil, throughout the state. Flowers develop before the leaves.

74. DWARF GRAY WILLOW; SAGE WILLOW (*Salix tristis* Ait.) A low shrub, in dry grounds, in all parts of the state. Flowers before the leaves.

75. SILKY WILLOW (*Salix sericea* Marsh.). Shrub, six to ten feet high, young leaves silky; rare in Iowa; in low grounds. Flowers appear before the leaves.

76. HOARY WILLOW (*Salix candida* Fluegge.). Shrub, two to five feet high. In bogs; rare in Iowa. Flowers develop before the leaves.

The willows are a difficult group to study, and it must not be expected that the brief notes here given will enable any one to identify all forms satisfactorily. Some conception of the number of forms represented in the State may be gained from this key, however.

77. VIRGINIA WINTERBERRY (*Ilex verticillata* (L). A. Gray.). A shrub or small tree, growing in swamps. Reported from Osage. Certainly rare in Iowa.

78. NINE-BARK (*Opulaster opulifolius* (L). Kuntze). A shrub three to seven feet high, with smooth flower-stalks, and producing handsome clusters of white flowers during the last week of May and early in June. Along streams and on shady banks. Rather common in eastern and southern Iowa, and deserving more attention. (See No. 96.)

79. AMERICAN MEADOW-SWEET (*Spiræa salicifolia* L.). A shrub two to four feet high, growing in swamps throughout the State, and producing its clusters of attractive, white or pinkish flowers in the summer.

80. BLACK CHOKEBERRY (*Aronia nigra*. (Willd.) (Britt.). A low shrub with black fruit, growing sparingly in this State, on rock exposures, in the extreme northeastern part. Flowers in April or May.

81. ROUND-LEAVED JUNE-BERRY (*Amelanchier rotundifolia*. (Mx.) Roem.) A shrub or small tree, growing in thickets northward. Flowers in May.

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New Jersey Tea. Eastern Iowa. See No. 87.

Leather Wood in leaf. See No. 64.
Photographs from B. Shimek.

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82. NORTHWESTERN JUNE-BERRY (*Amelanchier alnifolia* Nutt.). A shrub in dry soil, northward in the State; not common. Flowers in April, before the leaves appear.

83. SHAD-BUSH (*Amelanchier botryapium* L. f. DC.). Rare in Iowa. The only forms known to the writer from this state are low shrubs growing on rocky bluffs in Johnson county. They flower in May. The species is sometimes a small tree.

84. DWARF CHERRY (*Prunus pumila* L.). A low shrub, known in this state only from Winneshiek county, where it is rare, on sandstone exposures. Flowers in April or May.

85. CHOKE CHERRY (*Prunus Virginiana* L.). This well known species is a shrub or small tree, and grows on shaded banks, etc. It produces its pretty clusters of white flowers in May. It is worthy of cultivation. Throughout the state.

86. WILD PLUM (*Prunus Americana* Marsh.). The wild plum is usually a small tree, but in more exposed places, or in dense thickets, it is often a shrub. Common, especially on lower grounds. The flowers appear in April, before the leaves.

87. NEW JERSEY TEA (*Ceanothus Americanus* L.). A low shrub, common in all parts of the state in dry places, along roadsides, on prairies, etc. The pretty clusters of white flowers appear in June and July.

88. SMALLER RED-ROOT (*Ceanothus ovatus pubescens* T. & G.). Usually smaller than No. 87, and the leaves, etc., are more hairy. In dry soils in the northern and western parts of the state. Flowers in May or June.

89. WITCH-HAZEL (*Hamamelis Virginiana* L.). A large shrub. Rare in Iowa, occurring in the northeastern part only. It is found in rich, sometimes rocky, woods, and flowers in the fall.

90. HAZEL-NUT (*Corylus Americana* Walt.) More or less common in all the timbered sections of the state. Flowers in March, before the leaves develop.

91. LANCE-LEAVED BUCKTHORN (*Rhamnus lanceolata* Pursh.). A large shrub, with inconspicuous sweet-scented flowers, which appear in May. Usually in moist grounds, and locally rather common in the eastern part of the state.

92. ALDER-LEAVED BUCKTHORN (*Rhamnus alnifolia* L'Her.) A low shrub; in moist soils. Rare in Iowa. Known only from the extreme northeastern part of the state. Flowers small, green, opening in May.

93. SCRUB BUR-OAK (*Quercus macrocarpa olivaeformis* Mx. A. Gray). The bur-oak is usually a forest tree, but in western and northwestern Iowa it becomes a shrub, often not over a foot high when bearing acorns. This shrubby form grows on the dry hills and prairies, in exposed situations. Flowers in May.

94. CHINQUAPIN OAK (*Quercus prinoides* Willd.). A shrub from 1 to 7 feet high, growing on dry hills in the south-central part of the state. Acorns sweet. Flowers in May.

95. MISSOURI GOOSEBERRY (*Ribes Missouriensis* Nutt.). Resembles No. 25, but has gray shreddy bark, and grows in open thickets, etc. It is more common westward.

96. PRAIRIE NINE-BARK (*Opulaster intermedius* Ryd.). Resembles No. 78, but has hairy flower-stalks, etc. In the western part of the state.

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97. BUTTON-BUSH (*Cephalanthus occidentalis* L.) A large shrub, growing in or near water. Flowers in July and August, as a rule. Chiefly in the eastern and southern portions of the state.

EXPLANATION OF TERMS.

Alternate—Said of leaves when there is only one at each joint of the stem.

Axil—The upper angle between a leaf and the stem.

Ca yx—The outermost, usually green part of the flower.

Catkin—A loosely-hanging flower cluster of inconspicuous flowers, as in the cottonwood.

Compound—Said of leaves when divided into several distinct divisions, as in clover and locust.

Downy—Covered with loose, soft hairs.

Hairy—Covered with stiffer, straight hairs.

Leaflets—The divisions of a compound leaf.

Lobed—Said of leaves when cut more than a quarter of the way from the edge to tbe midrib, or to the base in palmate leaves.

Opposite—When two leaves are borne on opposite sides of the stem at each joint.

Palmate—Said of leaves when their lobes or leaflets run out from the base of the leaf, as in the buckeye, clover and Virginia creeper.

Pinnate—Said of leaves when their lobes or leaflets extend out from a midrib, as in the locust, etc.

Pod—A dry fruit which splits regularly to discharge the seed.

Simple—Said of leaves when the blade consists of one piece, though it may be deeply lobed; the opposite of *Compound*.

Stamens—The usually stalked structures in the flower which produce the powdery or waxy pollen.

Whorled—Said of leaves when three or more are found at the same joint of the stem.

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Button Bush in swamp. See No. 97.

Speckled Alder in flower, March. See No. 65.
Photographs from B. Shimek.

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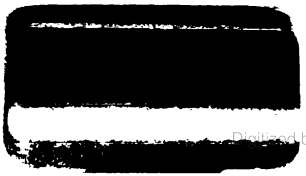

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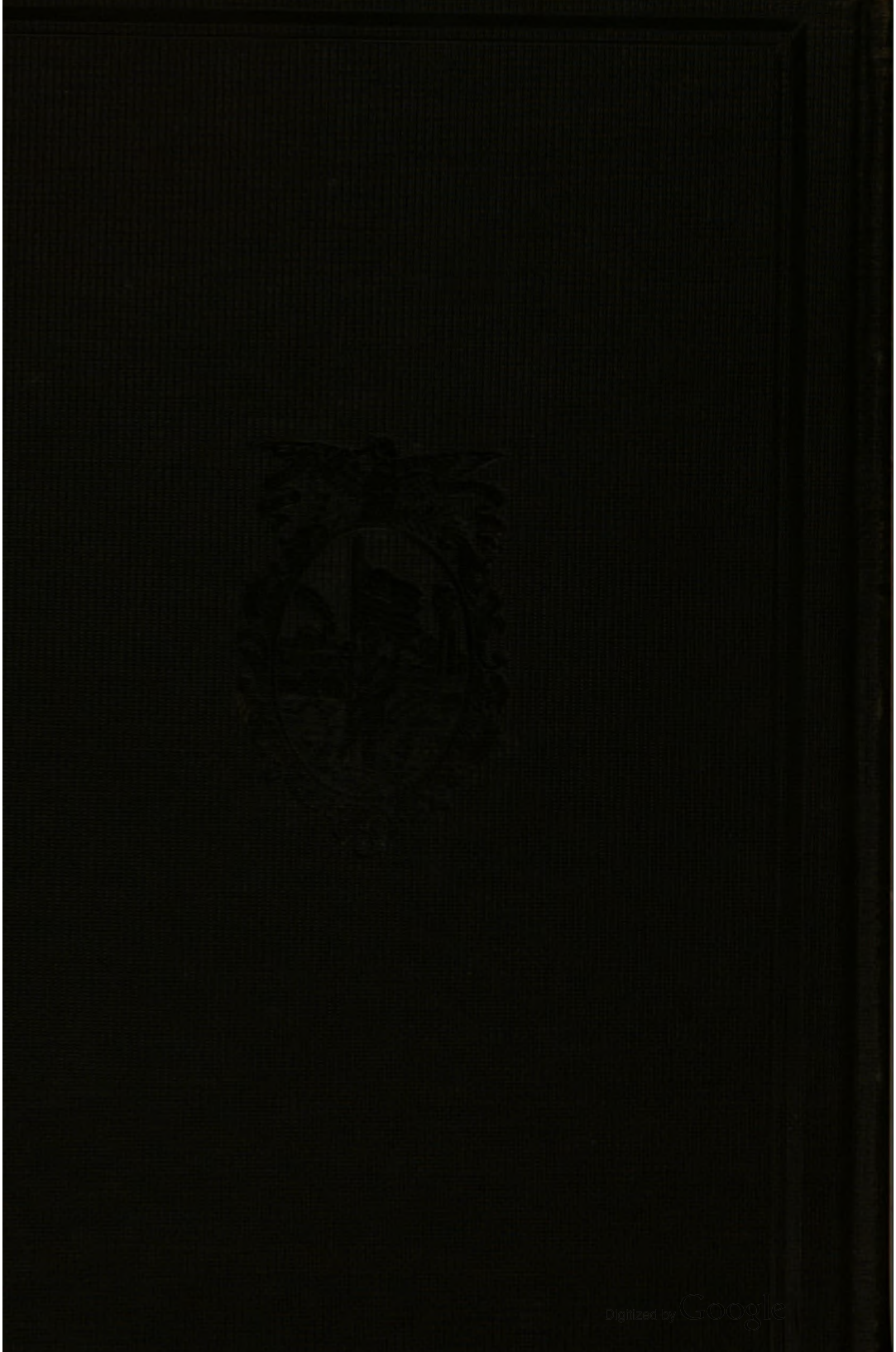
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